ORDER NO. HAD8607667C0
A6

Service Manual

Compact Disc Player

SL-P310

SL-P310

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

Color	Areas
(K)	[M].....U.S.A.
(K) (S)	[MC]...Canada.
(K) (S)	[E].....Switzerland and Scandinavia.
(K) (S)	[EK]....United Kingdom.
(K) (S)	[XL]....Australia.
(K) (S)	[EG]...F.R. Germany.
(K) (S)	[EB]....Belgium.
(K) (S)	[EH]...Holland.
(K) (S)	[EF]....France.
(K) (S)	[Ei].....Italy.
(K) (S)	[XA]....Asia, Latin America, Middle Near East, Africa and Oceania.
(K)	[XB]....Saudi Arabia.
(K) (S)	[PA]....East PX.
(K) (S)	[PE]....European Miliary.
(K) (S)	[PC]....European Audio Club.

Color

(K)...Black Type
(S)...Silver Type

SPECIFICATIONS

(*Measured by EIAJ (CP-307))

■ Audio

No. of channels: 2 (left and right, stereo)
Frequency response: 4—20,000 Hz ±0.3 dB*
Dynamic range: More than 95 dB*
S/N ratio: More than 96 dB*
Harmonic distortion: 0.002% (1 kHz, 0 dB)
Total harmonic distortion: 0.004% (1 kHz, 0 dB)*
Channel separation: More than 96 dB*
Wow and flutter: Below measurable limit
Low-pass filter: High-resolution digital filter

■ Signal Format

Sampling frequency: 44.1 kHz
Correction system: Technics Super Decoding Algorithm
D-A conversion: 16-bit linear

■ Pickup

Type: Fine-focus, one beam
Access time: 1 second (access to the last track)*
Light source: Semiconductor laser
Wavelength: 780 nm
Traverse system: High-speed linear access system
Spindle system: Brushless DD motor

■ Functions

Automatic play: All tracks.
Random access play: Track number.
Repeat play: Entire disc or programmed tracks.
Search: Forward/backward track skip.
Forward/backward manual search.
Program play: For up to 20 selections
Preset edit play: Up to 99 minutes (for program play)
Display: Total tracks.
Current track.
Time display:
- Time display (min., sec./dB).
- The following four time modes display minutes and seconds according to the time mode select button setting.
  1. Disc remaining playing time.
  2. Track number and remaining playing time of current track.
  3. Playing time from beginning of first track.
  4. Track number and elapsed playing time from beginning of current track.

Indicator: Play indicator.
Pause indicator.
Repeat indicator.
Disc indicator.
Remote control sensor
Disc loading: Motor-driven horizontal type.
Headphone output level: 15 mW max. 32Ω (fixed)

Technics

Matsushita Services Company
50 Meadowland Parkway,
Secaucus, New Jersey 07094

Panasonic Hawaii Inc.
91-238 Kauhi St. Ewa Beach
P.O. Box 774
Honolulu, Hawaii 96808-0774

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Panasonic Sales Company, Division of Matsushita Electric of Puerto Rico, Inc.
Ave. 65 De Infanteria, KM 9.7
Victoria Industrial Park
Carolina, Puerto Rico 00630

Matsushita Electric of Canada Limited
5770 Ambler Drive, Mississauga,
Ontario, L4W 2T3

Panasonic Tokyo Office
Matsushita Electric Trading Co., Ltd.
6th Floor, World Trade Center Bldg.,
No. 4-1, Hamamatsu-cho 2-Chome, Minato-ku,
Tokyo 105, Japan

■ Infrared remote control unit

Dimensions (W×D×H): 6.5×15.5×1.8 cm
Batteries: UM-3 "AA" batteries or IEC R6 or equivalent (1.5V×2)
Remote control functions: Numeric buttons (0—9)
Memory button
Clear button
Repeat button
Digital volume attenuation buttons
Time mode select button
Forward and backward skip/search buttons
Stop button
Play/pause button
Weight: 140 g (including batteries)

■ General

Power supply: For U.S.A. and Canada: AC 120V, 60Hz
For United Kingdom and Australia: AC 240V, 50Hz
For Continental Europe: AC 220V, 50Hz
For Others: AC110~127/220~240V, 50/60Hz
Power consumption: 10 W
Output voltage: 2 V (at 0 dB)*
Output impedance: Approx. 550Ω
Load impedance: More than 10 kΩ
Dimensions (W×D×H): 43×24×7.7 cm (16-15/16"×9-7/16"×3-1/32") [When disc holder is opened: 37.2 cm (14-21/32") (D)]
Weight: 3.1 kg (6.8 lbs.)

Specifications are subject to change without notice for further improvement.
Weight and dimensions are approximate.

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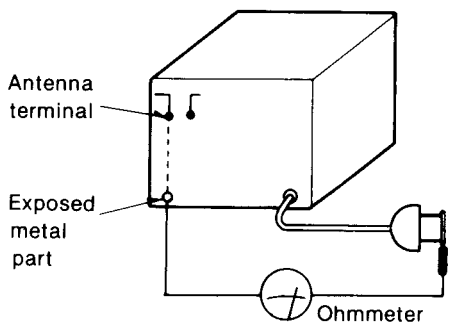
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

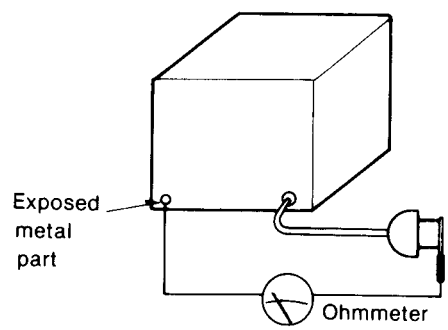
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



(Fig. B)

Resistance = Approx ∞

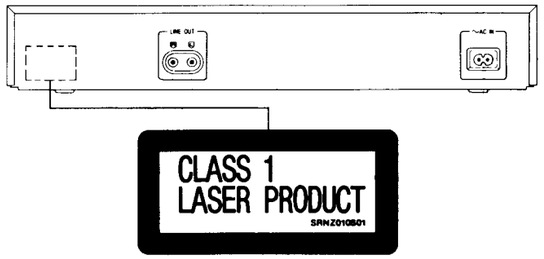
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ PRECAUTION OF LASER DIODE

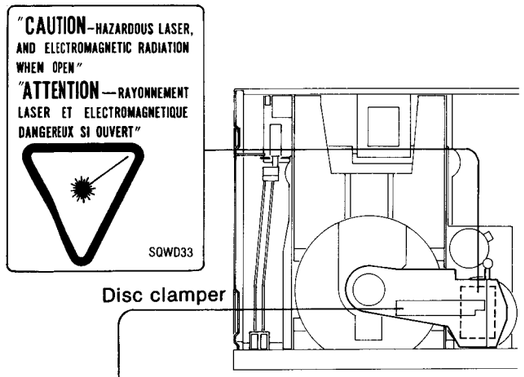
Caution: This product utilizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.

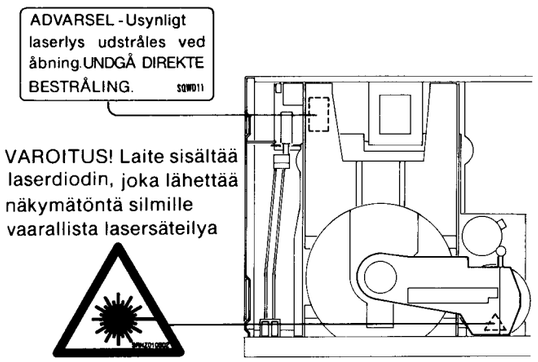
- **Use of caution labels** Note: ○ Mark is used, × Mark is not used.

Areas	Disc clamper	SQWD33	SQWD11	SRNZ010S01	SRNZ010S02
[M], [PA], [PE], [PC]	○	×	×	×	×
[MC]	○	○	×	×	×
[E]	○	×	○	○	○
[EK], [XL], [EG] [EB], [EH], [EF] [Ei], [XB], [XA]	○	×	×	○	○



Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

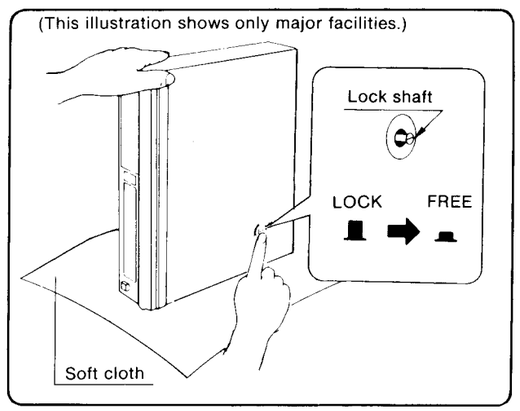

"CAUTION—HAZARDOUS LASER, AND ELECTROMAGNETIC RADIATION WHEN OPEN"
"ATTENTION—RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT"
SQWD33
Disc clamper
DANGER-Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.


ADVARSEL - Usynligt laserlys udstråles ved åbning. UNDGÅ DIREKTE BESTRÅLING.
SQWD11
VAROITUS! Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilya

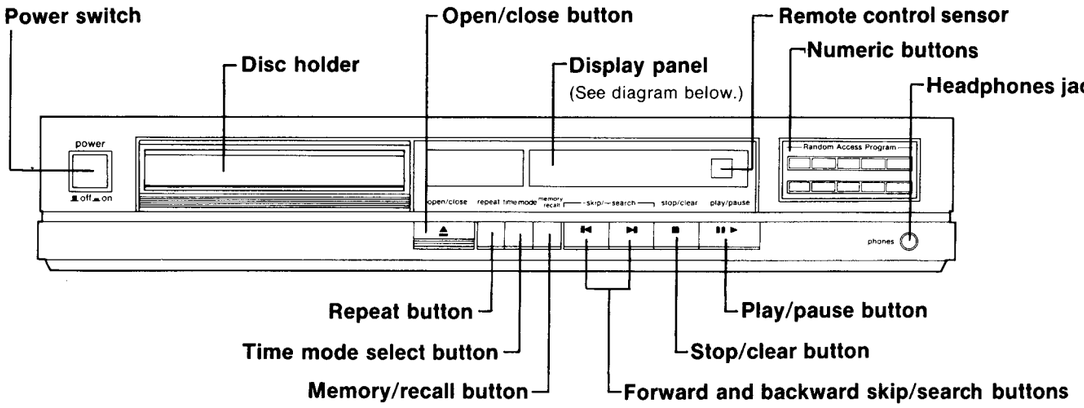
■ BEFORE USING THIS UNIT

1. Place a soft cloth under the unit to protect it from scratches.
2. Press the lock shaft on the bottom panel to the in (FREE) position (▙→▁).

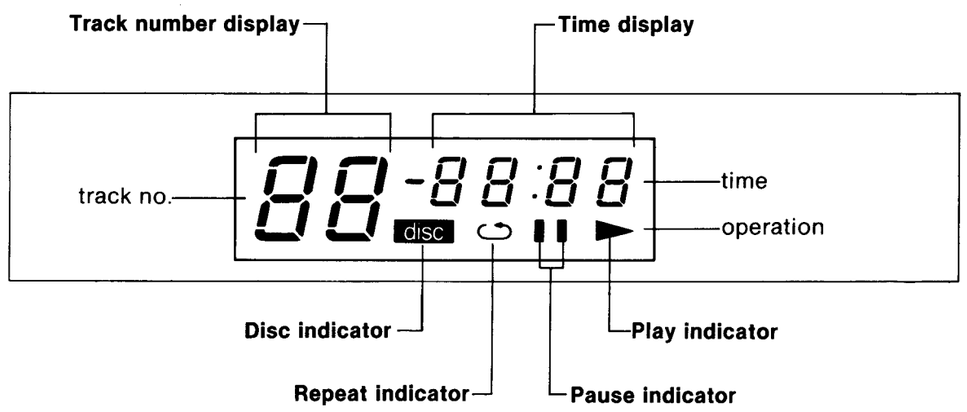
NOTE:
IF THE UNIT IS TRANSPORTED AGAIN, PERFORM THE FOLLOWING STEPS:
1) Remove the disc from the holder.
2) Pull the lock shaft to the out (LOCK) position (▁→▙).
CAUTION:
Do not transport the unit without locking the lock shaft.
SEVERE DAMAGE WILL RESULT.



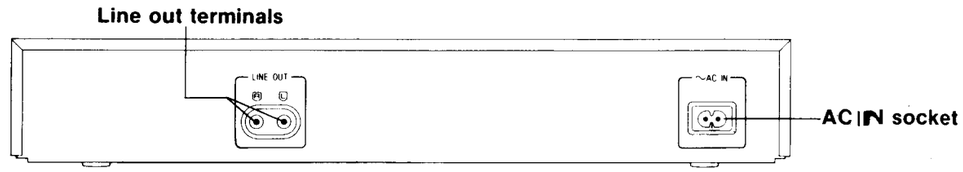
■ LOCATION OF CONTROLS



(Display panel)

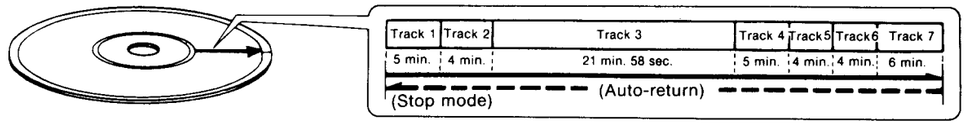


(Rear panel of player)



Playing a disc

The following explanation is for a disc containing 7 tracks having a total playing time of 49 minutes and 58 seconds.

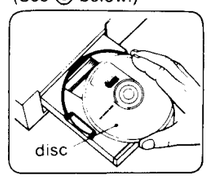


1 Automatic play (To play a disc from beginning to end.)

1 Press power to turn on (⏻ → ▲).
(See ① below.)

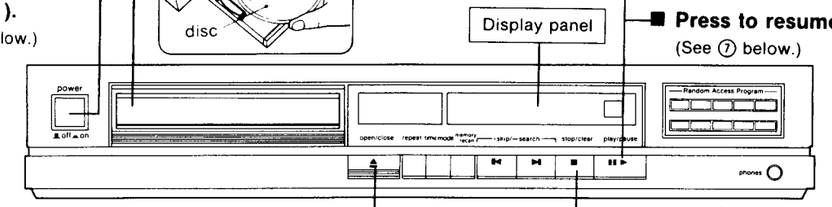
6 Press to turn off (▲ → ⏻).
(See ⑨ below.)

3 Insert a disc with the label side facing upward.
(See ② below.)



5 Press play/pause to start play.
(See ⑤ below.)

- Press to briefly interrupt play. (See ⑥ below.)
- Press to resume play. (See ⑦ below.)

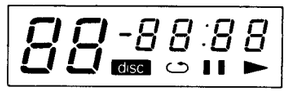


2 Press open/close to open disc holder.

4 Press to close disc holder.
(See ③, ④ below.)

- Press stop/clear to stop play.
(See ⑧ below.)

① Display momentarily illuminates as shown below:



Afterwards the display reads all zeros as shown in ④.

② Insert the disc only after the disc holder has opened all the way. If the disc is inserted too soon, it may be damaged. Do not tilt the unit while the disc holder is opening or closing since the disc could fall out of the holder.

③ Step 4 can be skipped by pressing the play/pause button after inserting a disc. In this case, the holder will close and disc play will begin directly from track 1, but the tracks and total playing time will not be displayed.

④ If the open/close button is pressed, the display illuminates as shown below.

Disc information is being read.
↓
Reading of disc information finished.

↓
Stop mode.

⑤ •The play indicator (▶) illuminates and play begins.

•After the last track has been played the pickup returns to the beginning of the first track and the unit switches to the stop mode.

⑥ The play indicator (▶) goes out, the pause indicator (❚❚) illuminates and the unit switches to the pause mode.

⑦ The pause mode is cancelled and play is resumed.

⑧ The pickup will return to the beginning of the first track and the unit will switch to the stop mode.

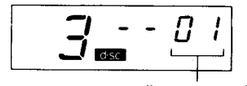
⑨ When the end of the disc is reached, the pickup returns to the beginning of the first track and the unit switches to the stop mode.
- Remove the disc from the disc holder.
- Turn off the power if the unit is not to be used again for a while.

- Since steps 1, 2, 3, 4 and 6 in this procedure are the same for all play procedures, they are not included in the following explanations.

2 Program play

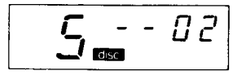
Example: To play track 3, track 5 and track 1 in that order.
(A maximum of 20 selections can be programmed.)

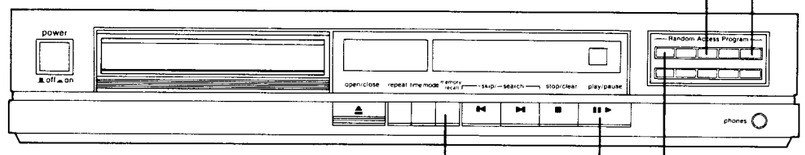
1 Press the numeric button 3 to specify track 3.
(See ① below.)



Program order

3 Press the numeric button 5 to specify track 5.





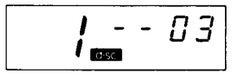
memory/recall

2 Press button to enter track number into memory. (See ②, ③ below.)

4 Press.

6 Press.

5 Press the numeric button 1 to specify track 1.



7 Press play/pause to start play.
The play indicator (▶) illuminates and play begins from track 3.

① E (error) will be displayed if a track number not on the disc is specified.

② If more than 20 selections are entered "F" (full) is shown in the display panel and no further selections can be programmed.

③ To enter the same track number in succession, simply press the memory/recall button the same number of times as that track is to be played.

Total playing time confirmation

To display the total playing time of all programmed tracks.
Example: If tracks 3, 5 and 1 are specified and the time mode select button is pressed, 30 minutes 58 seconds is displayed.

time mode
Press.

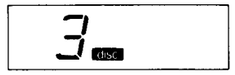
Notes:
- When entering a program during play, new entries can no longer be made if there is a gap of more than about 30 seconds between pressing any two button.
- All program entries are cancelled when the stop/clear button is pressed, or power is turned off.

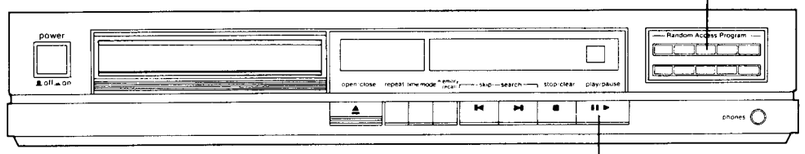
3 Random access play

Example: To play a disc from track 3 to the end of the disc.

1 Press the numeric button [3] to specify track 3.

The display shows track 3 specified.





play/pause

2 Press [▮▮▶] to start play.

The play indicator (▶) illuminates and play begins from track 3.

4 Skip play

(During play or the pause mode.)

■ Forward or backward track skip play

■ While watching the track number display, press for an instant the forward or backward skip/search button until the desired track has been located. (See ① below.)

[▶▮] Forward skip/search button (Pickup skips forward)

[▮◀] Backward skip/search button (Pickup skips backward)

5 Manual search play

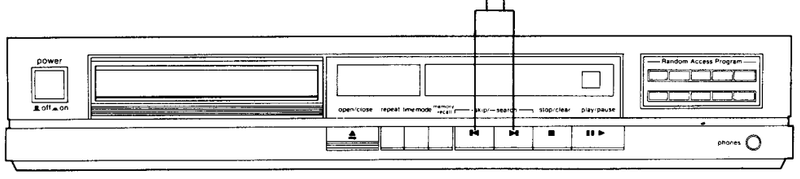
(During play or the pause mode.)

■ To play the disc from a specific point

■ Keep the forward or backward skip/search button pressed to move the pickup forward or backward. Release the button when the desired point has been reached (as shown by the display). (See ② below.)

[▶▮] Forward skip/search button (Pickup moves forward)

[▮◀] Backward skip/search button (Pickup moves backward)



① Pressing one of the skip buttons for an instant activates the quick skip mode.

Forward skip

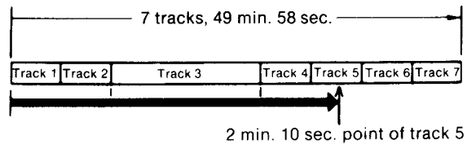
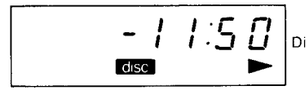
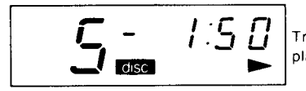
- During automatic play, the pickup skips to the beginning of the next track each time the button is pressed.
- During program play or program repeat play, the pickup skips to the beginning of the next programmed track each time the button is pressed.

Backward skip

- During automatic play, the pickup skips to the beginning of the current track. If pressed again quickly, the pickup skips to the beginning of the previous track.
- During program play (repeat function not activated), the pickup skips backward only to the beginning of the current track.
- During program repeat play, the pickup skips to the beginning of the current track. If pressed again quickly, the pickup skips to the beginning of the previous programmed track.

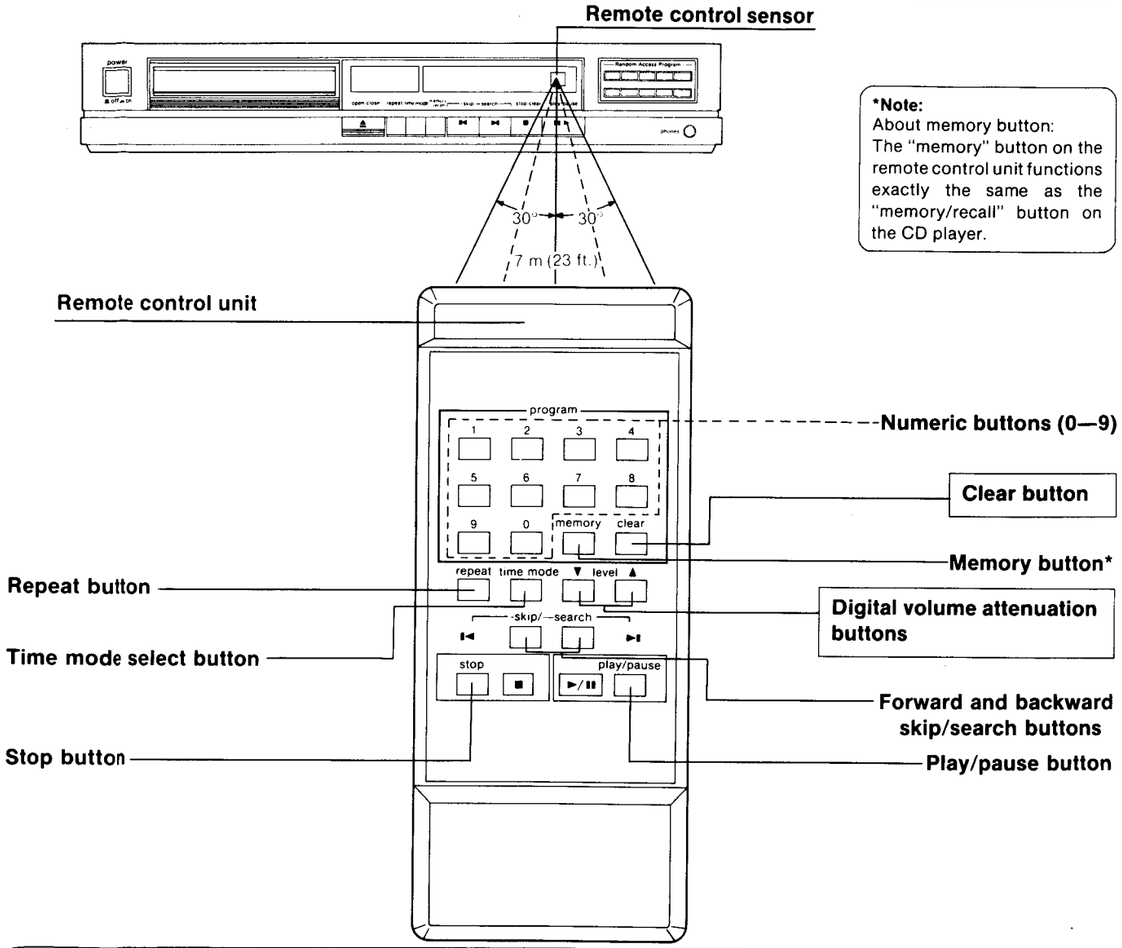
② • The pickup moves slowly at first and then rapidly if one of the buttons is held down for more than about 3 seconds.
- If one of the buttons is pressed while a disc is being played, sound from the disc can be heard as the pickup moves. The output level at this time is decreased by 12 dB (1/4) compared with the normal level.
- During program play, the pickup can only be moved between the beginning and end of the track currently being played.

6 Time mode display function (During play or in the pause mode.)

Procedure	Function
■ Press the time mode select button to change to a different time display mode. time mode [ ] **Press.** In the example, a disc of 49 min. 58 sec. is playing at a point 2 min. 10 sec. after the beginning of track 5.  **Note:** In the following cases the time display shows "--:--" when remaining playing time of the disc is displayed: 1. When a track number higher than 20 is programmed; 2. When the total programmed play time is more than 99 minutes. (For example, when one 20-minute track is programmed to play six times, the total playing time is 120 minutes.)	• Each time the time mode select button is pressed, the display mode changes in the following manner: Press.  Disc remaining playing time. (During program play, the total remaining programmed playing time is displayed.)  Track number and remaining playing time of current track. Playing time from beginning of first track. (During program play, programmed time from beginning of first programmed track is displayed.) Track number and elapsed playing time from beginning of current track.

7. Remote control unit

Parts identification



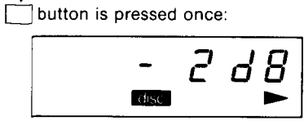
***Note:**
About memory button:
The "memory" button on the remote control unit functions exactly the same as the "memory/recall" button on the CD player.

When using the remote control unit, press the buttons slowly and accurately to avoid mistaken operation.

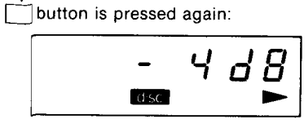
For digital volume attenuation

- To lower the volume level press the ▼ button. The volume level is altered down to −12 dB in 2 dB steps each time this button is pressed.
- Each time the ▼ button is pressed, the display mode changes to the attenuation mode. The digital volume level is displayed momentarily in the time display.

When the ▼ button is pressed once:



When the ▼ button is pressed again:



- After displaying the digital volume level, the display changes to the playing time mode.
- Press the ▲ button to return in steps of 2 dB to 0 dB. Volume is also returned to 0 dB automatically when power is switched off.
  (Headphone level is also affected.)

Program clear function

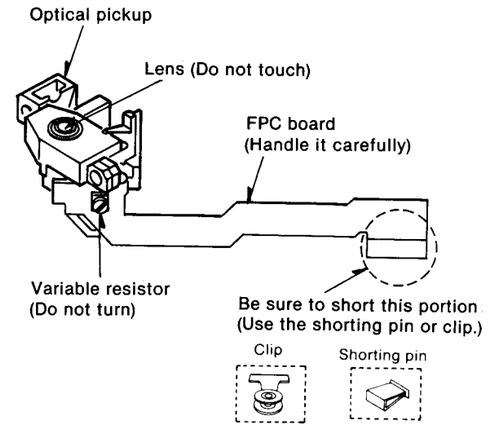
- If you make a mistake when entering a track number, press the clear button to cancel that entry. Each time this button is pressed, the previous entry is cleared.
- During disc play, however, the entire program is cleared when this button is pressed.
  (Preset edit play is also cancelled.)

■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

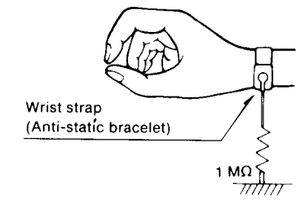
1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. **(FPC board)**
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board. **(FPC board)**
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

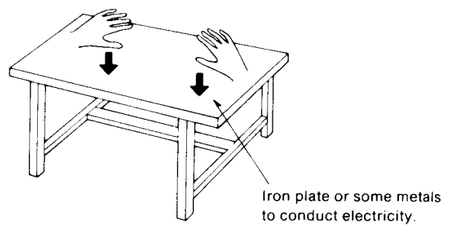


• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to relieve the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.

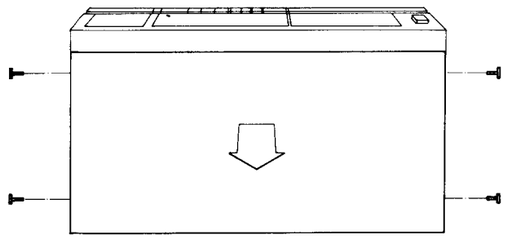




■ DISASSEMBLY INSTRUCTIONS

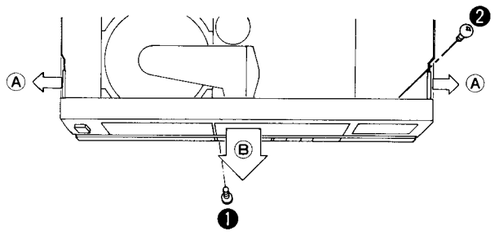
CAUTION:
- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When doing the job, removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

Ref. No. 1	How to remove the top case
Procedure 1	• Remove the 4 setscrews.

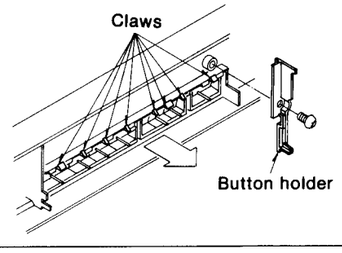


Note: When doing the job, Lock the lock shaft at bottom of the unit. (See page 3)

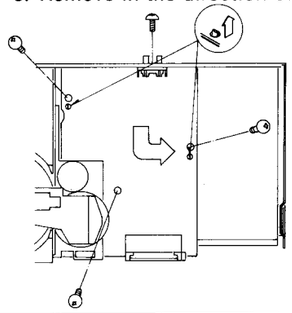
Ref. No. 2	How to remove the front panel
Procedure 1 → 2	1. Remove the 2 setscrew ❶, ❷. 2. Slightly pull the tabs outward (arrows Ⓐ). 3. Remove in the direction of the arrow Ⓑ.



Ref. No. 3	How to remove the operation button
Procedure 1 → 2 → 3	1. Remove the setscrew and button holder. 2. Release the 8 claws.



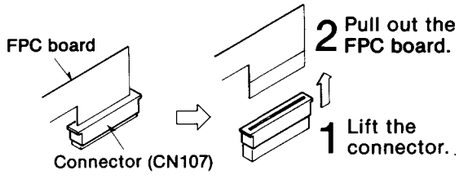
Ref. No. 4	How to remove the main P.C.B.
Procedure 1 → 2 → 4	1. Remove the 4 setscrews. 2. Lift the P.C.B. to remove it from the chassis tabs. 3. Remove in the direction of the arrow.



How to check the main P.C.B.

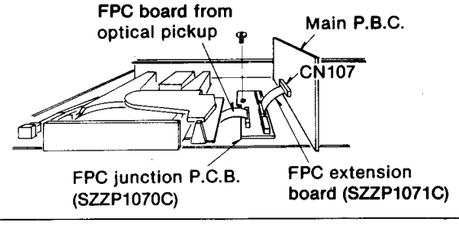
- When checking the soldered surfaces of the main P.C.B. and replacing the parts, do as shown.

1. Remove the main P.C.B. and relay P.C.B.
2. Remove the FPC board (CN107).



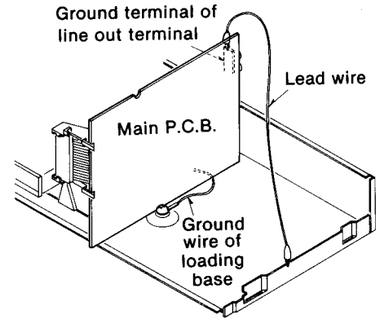
Caution: Insert the short pin into the FPC cord in order to prevent breakdown of laser diode. (See page 10)

3. Mount FPC junction P.C.B. (SZZP1070C) on the chassis. (Do the job as shown by using the main P.C.B. setscrew.)
4. Connect FPC board from optical pickup to FPC junction P.C.B.
5. Connect FPC extension board (SZZP1071C) to FPC junction P.C.B. and CN107 of main P.C.B.

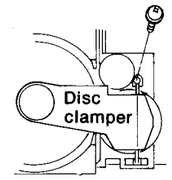


6. Place the main P.C.B. as shown in the figure.

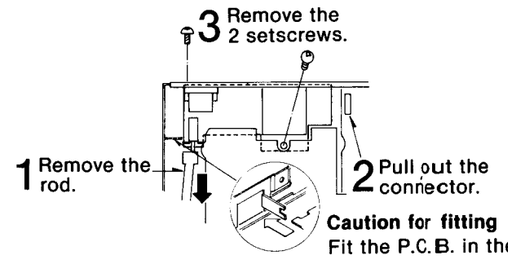
Cautions:
1. Be sure to connect the P.C.B. ground terminal (line out terminal) and chassis lead wire.
2. Connect the ground wire of loading base to the chassis.



Ref. No. 5	How to remove the disc clamper
Procedure 1 → 5	• Remove the setscrew.



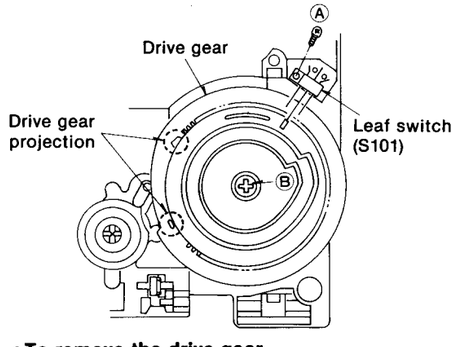
Ref. No. 6	How to remove the power supply P.C.B.
Procedure 1 → 6	• Remove in the numerical order shown. (Shift the disc holder forward.)



Caution for fitting
Fit the P.C.B. in the groove of chassis.

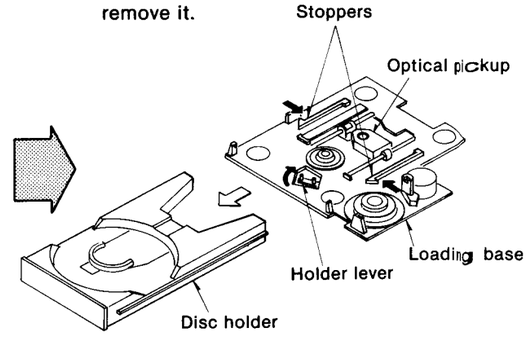
Ref. No. 7	How to remove the disc holder (disc tray)
Procedure 1 → 2 → 5 → 7	

- **Set the drive gear as shown below.** (Turn it completely to the right, then turn it to the left by about 20° so that drive gear teeth or projection will not touch the rack of disc holder.)



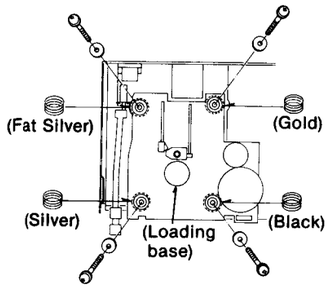
- **To remove the drive gear**
Remove the screw Ⓐ of leaf switch (S101), then remove the drive gear setscrew Ⓑ.

1. Push the holder lever backward, (From underneath the loading base.)
2. Pull the disc holder and bend the 2 claws of disc holder stopper of loading base toward the optical pickup.
3. Further pull out the disc holder to remove it.



- **Caution for fitting**
When fitting the disc holder, make the drive gear as shown on the left, and then insert the disc holder along the guide of loading base.
After inserting the disc holder completely, turn the drive gear to the right completely.

Ref. No. 8	How to remove the loading base
Procedure 7 → 8	Note: Lock the lock shaft at the bottom of the unit. • Remove the 4 setscrews.



Note the color of each spring, they must be reinstalled in their original position.

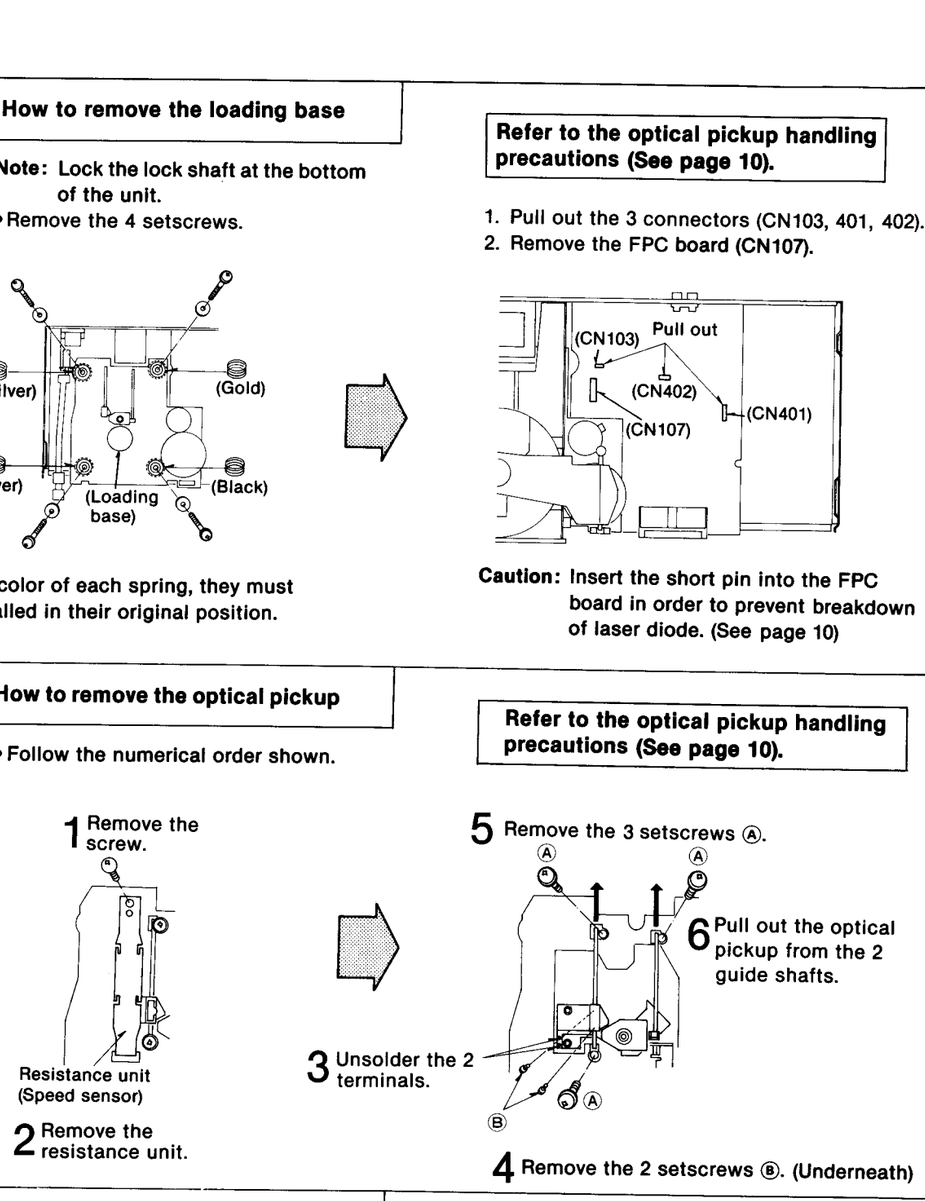
Refer to the optical pickup handling precautions (See page 10).

1. Pull out the 3 connectors (CN103, 401, 402).
2. Remove the FPC board (CN107).

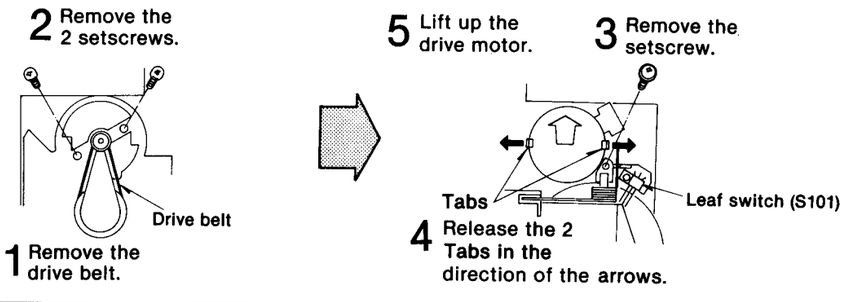
Caution: Insert the short pin into the FPC board in order to prevent breakdown of laser diode. (See page 10)

Ref. No. 9	How to remove the optical pickup
Procedure 7 → 8 → 9	• Follow the numerical order shown.

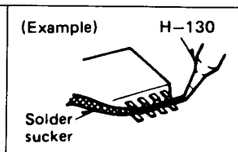
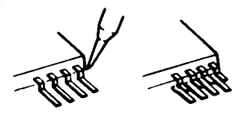
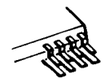
Refer to the optical pickup handling precautions (See page 10).


1 Remove the screw.
Resistance unit (Speed sensor)
2 Remove the resistance unit.
3 Unsolder the 2 terminals.
4 Remove the 2 setscrews Ⓑ. (Underneath)
5 Remove the 3 setscrews Ⓐ.
6 Pull out the optical pickup from the 2 guide shafts.

Ref. No. 10	How to remove the drive motor
Procedure 7 → 8 → 10	• Follow the numerical order shown.


2 Remove the 2 setscrews.
Drive belt
1 Remove the drive belt.
5 Lift up the drive motor.
3 Remove the setscrew.
Tabs
Leaf switch (S101)
4 Release the 2 Tabs in the direction of the arrows.

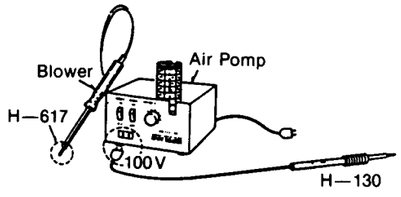
■ HOW TO REPLACE IC'S (Small outline type)

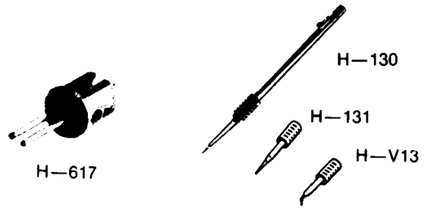
	Replacing procedure		Cautions
1	Reduce the amount of solder on each pin of the integrated circuit by use of a solder sucker.	(Example) H–130 	• Recommended tool .....Special soldering iron * H605M and H-130. * H605E and H-130. • Do not touch the soldering iron to the area for a long time. It may otherwise cause removal of the print foil. • When shifting the pin upward, do the job quickly while the solder is melting. If the solder is hard, it may cause removal or breakage of the print foil. • When using a pencil type soldering iron. 1. Completely remove the solder from each IC pin by use of solder sucker. 2. Raise each pin by means of an eyeleteer, hold the pliers then remove IC package from P.C.B.
2	Melt the solder on the pin (one electrode) with the soldering iron.		
3	While the solder is melting, shift the pin upward by the soldering iron to remove it from the foil.		
4	Remove each pin from the foil according to the above-mentioned procedure.		

*** Special soldering iron**
(Refer to Technical Information, ORDER NO. GAD84125486T1)...For U.S.A. and Canada
(Refer to Technical Information, ORDER NO. GAD84115476T8)...For others

•H–605 Spot Heater (hot-air solder iron)
This device that uses hot air to melt solder was developed to remove Flat-Package ICs, RHCs and chip parts.

- H–605M (For 120V power source)
- H–605E (For 200V/220V/240V power source)





•H–617 Twin Nozzle (for spot heater)
Special nozzle for the removal of RHCs and chip resistors. (Nozzle diameter: 1.0mm×2)

•H–130 Slim Pencil Solder Iron
An ultrasmall ceramic heater solder iron is extremely handy for soldering chip parts, RHCs, ICs etc., to high-density circuit boards.
Features:

• Rated power:	100V, 15W
• Max. temp.:	400°C
• Heater:	ceramic (long life)
• Insulation resistance:	100MΩ
• Length:	178mm
• Weight:	16g (not including cord)

•H–131, H–V13 Cap Bits
Solder tip for the slim pencil Solder Iron is composed of a bit holder and a corrosion resistance solder tip. Permits changing of solder tips even while still hot.

• Solder tip:	0.3mm

■ TERMINAL FUNCTION OF LSI

• MN15261PDU (System Control and FL Drive)

Pin No.	Mark	Signal	I/O Devision	Function
1	VSS	GND	I	GND terminal
2	X0	——	O	Not used (Open)
3	X1	SENSE	I	Optical servo condition input
4	P00	PC	O	Spindle motor control signal (ON·OFF command)
5	P01	M DATA	O	Command data output
6	P02	MCLK	O	Command clock output
7	P03	MLD	O	Command load output
8	P10	M-RLY	O	Muting relay control
9	P11	D-DAT	O	Data output
10	P12	$\overline{\text{SYNC}}$	O	Synchro recording control (Not used)
11	P13	$\overline{\text{D-OP}}$	O	Direct operation control (Not used)
12	$\overline{\text{SYNC}}$	——	O	Not used (Open)
13	$\overline{\text{RST}}$	RESET	I	Reset signal input (reset at "L")
14	$\overline{\text{IRQ}}$	BLKCK	I	Sub-code block (Q data) clock (75Hz) input
15 ⟩ 18	P50 ⟩ P53	——	I	Key scan input
19	$\overline{\text{SBT}}$	$\overline{\text{CLDCK}}$	I	Sub-code frame clock (7.35kHz)
20	$\overline{\text{SBD}}$	SUBQ	I	Sub-code Q data input
21	P20	TGC	O	———
22	P21	$\overline{\text{TRV-H}}$	O	Traverse servo control signal
23	P22	$\overline{\text{TRV-R}}$	O	Traverse reverse command signal
24	P23	$\overline{\text{RRV-F}}$	O	Traverse forward command signal
25	P30	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [Reverse] command)
26	P31	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [Forward] command)
27	P32	CNT2	O	Optical servo IC control signal (TRON: Tracking servo)
28	P33	CNT1	O	Optical servo IC control signal (FOON: Focus servo)
29	P40	START	I	Key input strobe and processing status input from signal processing LSI traverse position detection.
30	P41	$\overline{\text{D END}}$	O	Data (end signal) signal
31	P42	$\overline{\text{FLOCK}}$	I	Optical servo condition (focus) input
32	P43	$\overline{\text{SENSE}}$	I	Optical servo condition (track cross) input
33	PE0	$\overline{\text{CLOSE}}$	O	Loading motor close command (ON at "L")
34	PE1	$\overline{\text{OPEN}}$	O	Loading motor open command (ON at "L")
35	P60	$\overline{\text{CLK}}$	O	Clock signal output
36	P61	D-STA	O	Data start signal
37	DAC	DAC	O	———
38	VPP	——	I	FL drive power supply (connected to −32V)
39 ⟩ 52	D0 ⟩ DD	——	O	FL grid signal and key scan signal
53 ⟩ 61	S8 ⟩ S0	——	O	FL anode signal
62	OSC2	——	I	Clock terminal
63	OSC1	——	I	Clock input
64	VDD	——	I	Power supply (connected to +5V)

• MN1550PDT (Remote Control Signal Processing)

Pin No.	Mark	Signal	I/O Devision	Function
1	VDD	——	I	Power supply (connected to +5V)
2	OSC	SMCK	I	Clock input
3	P23	——	——	———
4	P22	——	——	———
5	RST	RESET	I	Reset signal input
6	P21	——	——	———
7	P20	——	I	Remote control signal input
8	IRQ	——	I	Program enable/de-enable control
9	SYNC	——	O	Clock output
10 ⟩ 13	P10 ⟩ P13	Data	I	Key strobe
14 ⟩ 17	P00 ⟩ P03	Data	I	Key strobe
18	VSS	GND	I	GND terminal

• MN6617 (Digital Signal Processing : EFM Decoder, Error Correction, CLV Servo)

Pin No.	Mark	I/O Devision	Function
1	BLKCK	O	Sub-code block (Q data) clock (75 Hz)
2	$\overline{\text{CLDCK}}$	O	Sub-code frame (Q data) clock (7.35 kHz)
3	$\overline{\text{SUBQ}}$	O	Sub-code (Q data) output
4	CRC	O	Sub-code (Q data) CRC check (Not used, open)
5	$\overline{\text{RST}}$	I	Reset signal input (reset at "L")
6	MLD	I	Command load input
7	MCLK	I	Command clock input
8	MDATA	I	Command data input
9	DMUTE	I	Muting control (muting ON at "H")
10	$\overline{\text{TRON}}$	I	Tracking servo ON signal (tracking servo ON at "L")
11	STAT	O	Processing condition (CRC, OTC, CLVOK, TT STOP) output
12	SMCK	O	Clock output (4.2336 MHz)
13	PMCK	O	Pitch control clock output (Not used, open)
14	ITC	I	Track counter input signal (Not used, connected to +5V)
15	$\overline{\text{TEST}}$	I	Test mode selection (Not used, connected to +5V)
16	X2	O	Clock output (16.9344 MHz)
17	X1	I	Clock input (16.9344 MHz)
18	SEL	I	DA output parallel/serial selection (serial at "L")
19	LDG/WDCK	O	L channel deglitch signal/serial data word clock.
20	RDG	O	R channel deglitch signal.
21	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
22	IPFLAG	O	Interpolation flag (interpolation at "H")
23	FLAG0	O	Error flag (error at "H")
24	FLAG6	O	16 K RAM address reset signal (reset at "H")
25	XCK	O	Clock (16.9344 MHz) output (Not used, open)
26	DA15/ SRDATA	O	16-bit data output/serial data output (MSB first)
27	DA14/ SRDATAX	O	16-bit data output/serial data output (LSB first)
28	DA13/SRCK	O	16-bit data output/serial data beat clock.
29	DA12/WDCK	O	16-bit data output/serial data word clock (Not used)
30	DA11/ BYTCK	O	16-bit data output/serial data byte clock (Not used)
31	GND	I	GND terminal
32	DA10/RIL	O	16-bit data output/RIL signal
33	DA9/RESY	O	16-bit data output/ Resynchronizing signal
34	DA8/FCLV	O	16-bit data output/Synchronizing detection signal (Not used)
35	DA7/ IPBYTE	O	16-bit data output/Interpolation flag for each byte (Not used)
36	DA6/IPSEL	I/O	16-bit data output/ interpolation inhibit (Not used)
37	DA5/FLAG5	O	16-bit data output/C2 decoder correction flag 3 (Not used)
38	DA4/FLAG4	O	16-bit data output/C2 decoder correction flag 2 (Not used)
39	DA3/FLAG3	O	16-bit data output/C2 decoder correction flag 1 (Not used)
40	DA2/FLAG2	O	16-bit data output/C1 decoder correction flag 2 (Not used)
41	DA1/FLAG1	O	16-bit data output/C1 decoder correction flag 1 (Not used)
42	DA0/FLCK0	O	16-bit data output/Crystal frame clock
43 ⟩ 50	D7 ⟩ D0	I/O	16 K RAM data output
51	RAMOE	O	16 K RAM $\overline{\text{OE}}$ signal
52	RAMWE	O	16 K RAM $\overline{\text{WE}}$ signal
53 ⟩ 63	RAMA 0 ⟩ RAMA10	O	16 K RAM address signal (RAMA0 : LSB, RAMA10: MSB)
64	PC	O	Spindle motor ON signal (ON at "L")
65	EC	O	Spindle motor drive signal
66	FG	I	Spindle motor FG signal input
67	——	——	———
68	——	——	———
69	——	——	———
70	——	——	———
71	——	——	———
72	PCK	I	PLL extract clock input
73	VDD	I	Power supply (connected to +5V)
74	EFM	I	EFM signal input (PLL)
75	SRF	I	EFM signal input (DSL)
76	DO	I	Drop-out signal (Drop-out at "H")
77	CLVS	O	11T servo OK signal (OK at "H")
78	FPC	O	PLL frequency comparision signal
79	BSSEL	O	PLL frequency in take operation signal.
80	——	——	———
81	——	——	———
82	——	——	———
83	SUBC	O	Sub-code serial output data
84	SBCK	I	Clock for sub-code serial output

• AN8370S (Optical Servo Control)

Pin No.	Mark	I/O Devision	Function
1	VEE	I	Power supply (connected to −5V)
2	LSA	I	Phase difference input (A)
3	GND	I	GND terminal
4	LSB	I	Phase difference input (B)
5	APC	O	Auto laser power control output
6	TEOUT	O	Tracking error signal output
7	TEG	I	Tracking error gain adjusting input
8	TE−	I	Phase difference-voltage conversion (−)
9	TE +	I	Phase difference-voltage conversion (+)
10	APC −	O	Laser power inversion input
11	C·MEM	I	Capacitor connection for phase difference memory
12	APC +	I	Laser power non-inversion input
13	VREF	O	Reference current generation
14	SENSE	O	Selector output (track-crossed)
15	HIN	I	Tracking hold circuit input
16	HOUT	O	Tracking hold circuit output
17	SPCNT	O	Track-cross speed control output (not used, grounded)
18	C·MSP	I	Track-cross reference speed setting capacitor connection (not used, grounded)
19	C·AF	I	Auto focus timer capacitor connection
20	KICK R/$\overline{F}$	O	Track kick signal output
21	VCC	I	Power supply (connected to +5V)
22	CNT1	I	Control input ($\overline{FOON}$: Focus servo ON signal)
23	CNT2	I	Control input ($\overline{TRON}$: Tracking servo ON signal)
24	CNT3	I	Control input (KICKF : Kick direction [forward] command)
25	CNT4	I	Control input (KICKR : Kick direction [reverse] command)
26	$\overline{F\cdot LOCK}$	O	Focus lock signal output
27	C·FBDO	O	Capacitor connection for inversion RF high speed detection
28	C·SBDO	O	Capacitor connection for inversion RF low speed detection
29	C·SBRT	O	Capacitor connection for non-inversion RF low speed detection
30	C·FBRT	O	Capacitor connection for non-inversion RF high speed detection
31	RF OUT	O	RF signal output
32	BDO	O	Drop-out detection output
33	RFIN	I	RF signal input
34	S·OUT	O	Focus search signal output
35	C·LW	I	Capacitor connection for triangular wave generation
36	FE·OUT	O	Focus error signal output
37	FEG	I	Focus error gain adjusting input
38	FE·REF	I	Focus error comparison voltage generation
39	PDB	I	Photo detector current input (B)
40	IVB	O	Current/voltage conversion output (B)
41	IVA	O	Current/voltage conversion output (A)
42	PDA	I	Photo detector current input (A)

• EHDGA1243 (Data Slice and PLL)

Pin No.	Mark	I/O Devision	Function
1	PCK	O	Clock output extracted from SRF
2	EFM	O	EFM signal output synchronized with PCK
3	D·GND	I	GND terminal (digital system)
4	SRF	O	RF signal output data-sliced into digital value
5	SLC	I	Slice level control signal input
6	DO	O	Drop-out detection pulse output
7	FPC	I	Frequency comparison error signal input.
8	VCC	I	Power supply (connected to +5V)
9	NC	——	Non connection
10	VR	I	Resistor connection for VCO oscillation frequency
11	VEE	I	Power supply (connected to −5V)
12	VC1	I	Capacitor connection for VCO oscillator frequency
13	VC2	I	Capacitor connection for VCO oscillator frequency
14	A·GND	I	GND terminal (analog system)
15	RF	I	RF signal input

• MN6618 (Digital Filter)

Pin No.	Mark	I/O Device	Function
1	———	——	———
2	D012	O	16-bit parallel data output
3	D011/SCK	O	16-bit parallel data output/ serial output bit clock
4	D010/SOUT	O	16-bit parallel data output/ serial output data
5	GND	I	GND terminal
6	D09	O	16-bit parallel data
7	———	——	———
8	D08	O	16-bit parallel data
9	D07	O	16-bit parallel data
10	———	——	———
11	———	——	———
12	D06	O	16-bit parallel data
13	D05	O	16-bit parallel data
14	D04	O	16-bit parallel data
15	D03/2RLCK	O	16-bit parallel data/RL signal
16	———	——	———
17	———	——	———
18	D02/WCK	O	16-bit parallel data/serial output word clock
19	D01	O	16-bit parallel data
20	D00	O	16-bit parallel data (LSB)
21	MDATA	I	Command data input
22	———	——	———
23	MCLK	I	Command clock input
24	MLD	I	Command load input
25	———	——	———
26	$\overline{RST}$	I	Reset signal input (reset at "L")
27	VDD	I	Power supply (connected to +5V)
28	LRCK	I	R/L signal
29	———	——	———
30	SFT	I	Serial data input clock
31	SIN	I	Serial data input
32	———	——	———
33	X OUT	O	Clock output (Not used)
34	X IN	I	Clock input (16.9344 MHz)
35	OSEL	I	DA output parallel/serial selection. (parallel at "H")
36	LDGL	O	L channel deglitch signal
37	RDGL	O	R channel deglitch signal
38	VDD	I	Power supply (connected to +5V)
39	D015	O	16-bit parallel data (MSB)
40	D014	O	16-bit parallel data
41	———	——	———
42	D013	O	16-bit parallel data

• AN8290S (Spindle Motor Drive)

Pin No.	Mark	I/O Devision	Function
1	GND	I	Minimum potential of IC control. (In this unit, it is connected to VEE [−8.5V])
2	DCR	I	Standard voltage of FAI, PC, CLK. (In this unit, it is connected to 2.5V.)
3	FAI	I	Torque command filter amp. input. (Normal rotation command when FAI < DCR.)
4	FAO	O	Filter amp. output.
5	DI	I	Absolute value circuit input.
6	LPF	I	Capacitor terminal for low pass filter of current feedback loop.
7	A1	O	Drive signal output.
8	A2	O	
9	A3	O	
10	PGND	I	Minimum potential of IC power. (In this unit, it is connected to VEE [−8.5V])
11	CS	I	Drive current detection resistor terminal.
12	PVCC	I	Power input for IC power.
13	H3−	I	Not used in this unit.
14	H3+	I	
15	H2−	I	Negative output of Hall element is input.
16	H2+	I	Positive output of Hall element is input.
17	H1−	I	Negative output of Hall element is input.
18	H1+	I	Positive output of Hall element is input.
19	HSW	I	Bias switch of Hall element. (OFF when PC > DCR)
20	HB	I	Bias power of Hall element.
21	VCC	I	Power input for IC control.
22	PC	I	Power control. (Power down mode when PC > DCR)
23	CLK	I	Clock input. (DCR standard, operated at the edge of rise.)
24	TC	I	Triangular wave generation capacitor terminal.

■ RESISTORS AND CAPACITORS

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. Unless otherwise specified, All resistors are in OHMS (Ω) K = 1000Ω, M = 1000kΩ. All capacitors are in MICORFARADS (μF), P = 10^{-6}μF.

Numbering System of Resistor

Example

ERD	S2	T	J	101	
Type	Wattage (1/4W)	Shape	Tolerance (± 5%)	Value (1kΩ)	
ERJ	8	GEY	J	102	[ ]
Type	Wattage (1/8W)	Shape	Tolerance (± 5%)	Value (1kΩ)	Specialuse

Resistor Type	Wattage	Tolerance
ERD : Carbon ERJ : Chip Type Carbon	S2 : 1/4W 8 : 1/8W	J : ± 5% K : ± 10%

Numbering System of Capacitor

Example

ECKD	1H	102	K	C
Type	Voltage (50V)	Value (0.001μF)	Tolerance (± 10%)	Peculiarity
ECEA	0G	KS	470	L
Type	Voltage (4V DC)	Peculiarity use	Value (47μF)	Special use
GR426	B	273	K	25
Type	Peculiarity	Value (0.027μF)	Tolerance (± 10%)	Voltage (25V)

- **Indication of RCBS type capacitor (Axial type)**
- **Rated voltage**

The rated voltages are indicated by insulating paint colors.

Rated voltage (DC)	Paint color
16V	Pink
50V	Light-green

Type		Voltage	Tolerance
ECEA	: Electrolytic	**ECEA, AR, REC, ECEV Types**	F : ± 1 pF J : ± 5% K : ± 10% M : ± 20% Z : +80 −20% N : ± 30% P : +100 0%
ECEA..N	: Non-Polar Electrolytic	0G : 4V 0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1V : 35V 1H : 50V	
ECEV	: Electrolytic (Chip Type)		
ECQM	: Polyester		
ECFR, ECKD, ECFF, ECCD	: Ceramic	**Others** 1E : 25V DC 1H : 50V DC 50 : 50V DC 2B : 125V DC KC : 125V AC	
GR426	: Ceramic (Chip Type)		
RCBS	: Ceramic (Axial Type)		

- **Electrostatic capacity and characteristics**

The nominal electrostatic capacites (PF), tolerances and temperature characteristics are indicated by color codes.

Color band	Brown	Red	Orange	Yellow	Green	Blue	Purple	Gray	White	Black	Gold	Silver
1st, 2nd color bands (Effective number of nominal electrostatic capacity)	1	2	3	4	5	6	7	8	9	0	—	—
3rd color band (Multiplier of nominal electrostatic capacity)	10^1	10^2	10^3	10^4	—	—	—	—	—	10^0	10^{-1}	10^{-2}
4th color band (Tolerances)	—	—	—	—	—	—	—	N	Z	M	J	K
5th color band (Temperature characteristic)												

● RESISTORS

Ref. No.	Part No.	Value
R11, 12	ERDS2TJ681	680
R13	ERDS2TJ221	220
R14	ERDS2TJ101	100
R15, 16	ERDS2TJ561	560
R17	ERDS2TJ222	2.2K
R18	ERDS2TJ822	8.2
R19	ERDS2TJ103	10K
R20	ERDS2TJ332	3.3K
R21	ERDS2TJ153	15K
R22, 23	ERDS2TJ682	6.8K
R24, 25	ERDS2TJ471	470
R26	ERDS2TJ471	470
R101	ERDS2TJ154	150K
R102, 103	ERDS2TJ472	4.7K
R104	ERDS2TJ223	22K
R105	ERDS2TJ334	330K
R107	ERDS2TJ683	68K
R108	ERDS2TJ332	3.3K
R109	ERDS2TJ822	8.2K
R110, 111	ERDS2TJ682	6.8K
R112	ERDS2TJ822	8.2K
R113, 114	ERDS2TJ182	1.8K
R115	ERDS2TJ102	1K
R116, 117	ERDS2TJ182	1.8K
R118	ERDS2TJ102	1K
R119	ERDS2TJ471	470
R120	ERDS2TJ120	12

Ref. No.	Part No.	Value
R141	ERDS2TJ102	1K
R142	ERDS2TJ333	33K
R143	ERDS2TJ224	220K
R144	ERDS2TJ333	33K
R145	ERDS2TJ153	15K
R146	ERDS2TJ122	1.2K
R147	ERDS2TJ682	6.8K
R148	ERDS2TJ104	100K
R149	ERDS2TJ152	1.5K
R150	ERDS2TJ103	10K
R151	ERDS2TJ101	100
R152	ERDS2TJ153	15K
R153	ERDS2TJ270	27
R154	ERDS2TJ3R3	3.3
R161	ERDS2TJ333	33K
R162	ERDS2TJ222	2.2K
R163	ERDS2TJ333	33K
R164	ERDS2TJ153	15K
R165	ERDS2TJ122	1.2K
R166	ERDS2TJ102	1K
R167	ERDS2TJ681	680
R168	ERDS2TJ272	2.7K
R169	ERDS2TJ392	3.9K
R170	ERDS2TJ101	100
R171	ERDS2TJ270	27
R172	ERDS2TJ3R3	3.3
R180	ERDS2TJ474	470K

Ref. No.	Part No.	Value
R181	ERDS2TJ222	2.2K
R182, 183	ERDS2TJ564	560K
R184	ERDS2TJ472	4.7K
R185, 186	ERDS2TJ473	47K
R187, 188	ERDS2TJ473	47K
R189	ERDS2TJ123	12K
R190	ERDS2TJ332	3.3K
R191	ERDS2TJ154	150K
R192	ERDS2TJ824	820K
R193	ERDS2TJ101	100
R194	ERDS2TJ683	68K
R195, 196	ERDS2TJ103	10K
R197	ERDS2TJ473	47K
R198	ERDS2TJ333	33K
R301	ERDS2TJ102	1K
R302	ERDS2TJ472	4.7K
R303, 304	ERDS2TJ102	1K
R305	ERDS2TJ104	100K
R307	ERDS2TJ471	470
R401, 402	ERDS2TJ223	22K
R403	ERDS2TJ472	4.7K
R404	ERDS2TJ394	390K
R406	ERDS2TJ394	390K
R407	ERDS2TJ152	1.5K
R408, 409	ERDS2TJ472	4.7K
R410, 411	ERDS2TJ472	4.7K
R412, 413	ERDS2TJ472	4.7K

Ref. No.	Part No.	Value
R414, 415	ERDS2TJ472	4.7K
R416	ERDS2TJ913	91K
R417	ERDS2TJ124	120K
R418	ERDS2TJ913	91K
R419	ERDS2TJ124	120K
R420	ERDS2TJ101	100
R421, 422	ERDS2TJ103	10K
R424	ERDS2TJ473	470K
R425, 426	ERDS2TJ103	10K
R427, 428	ERDS2TJ103	10K
R429, 430	ERDS2TJ222	2.2K
R431, 432	ERDS2TJ222	2.2K
R433	ERDS2TJ103	10K
R434	ERDS2TJ472	4.7K
R501, 502	ERJ8GEXK1R5	1.5
R503	ERJ8GEYJ223	22K
R801, 802	ERDS2TJ102	1K
R803, 804	ERDS2TJ122	1.2K
R805, 806	ERDS2TJ221	220
R807, 808	ERDS2TJ391	390
R809, 810	ERDS2TJ473	47K
R811, 812	ERDS2TJ563	56K
R813, 814	ERDS2TJ560	56
R815, 816	ERDS2TJ223	22K
R817, 818	ERDS2TJ102	1K
R1001	ERDS2TJ103	10K

● CAPACITORS

Ref. No.	Part No.	Value
C1 ⚠	ECKDKC103PF	0.01
C11, 12	ECFR1H104ZF	0.1
C13	ECEA1CU470	47
C14	ECFR1H104ZF	0.1
C15, 16	ECEA1CU221	220
C17	ECFR1H104ZF	0.1
C18	ECFF1H104ZF	0.1
C19, 20	REC1A101M0T	100
C21, 22	ECEA1CU222	2200
C23, 24	ECEA1CU331	330
C25, 26	ECEA1VU101	100
C27, 28	ECEA0JU331	330
C29	ECEA0JU101	100
C101	ECFR1H104ZF	0.1
C102, 103	ECKD1H102KB	0.001
C104	ECKD1H681KB	680P
C105, 106	ECKD1H471KB	470P
C107	ECCD1H220K	22P
C108	ECEA1HU0R1	0.1
C109	ECEA1HU010	1

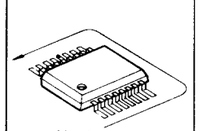
Ref. No.	Part No.	Value
C110	ECQV1H104JZ	0.1
C111, 112	ECEA1HU100	10
C113	ECEA1HKNR33	0.33
C114	RCBS1C182MXY	0.0018
C115	RCBS1C682MXY	0.0068
C116	ECQM1H333KV	0.033
C117	RCBS1H221KBY	220P
C118	ECEA1HU010	1
C119	ECEA0JU220	22
C120	RCBS1H681KBY	680P
C121	ECKD1H103KB	0.01
C122, 123	ECCD1H101KB	100P
C124	ECFR1H104ZF	0.1
C125	ECEA0JU220	22
C126	ECEA0JU470	47
C127, 128	ECKD1H102KB	0.001
C141	ECQM1H153KV	0.015
C142	ECQM1H122KV	0.0012
C143	ECQM1H473KV	0.047
C144	ECEA1VSN2R2	2.2

Ref. No.	Part No.	Value
C145	ECEA1HSNR22	0.22
C161	ECQM1H153KV	0.015
C162	RCBS1H681KBY	680P
C163	ECQM1H103KV	0.01
C164	ECEA1ESN3R3	3.3
C165	ECEA1HSN0R1	0.1
C181	ECQM1H104KV	0.1
C182	ECCD1H221KB	220P
C183	ECQM1H103KV	0.01
C184	ECEA1HSN010	1
C186	ECFR1H104ZF	0.1
C187	ECEA1VSN2R2	2.2
C301	ECCD1H220K	22P
C302	ECCD1H070C	7P
C303	ECEA1VSN2R2	2.2
C304, 305	ECFR1H104ZF	0.1
C306	ECKD1H103KB	0.01
C307	ECKD1H471KB	470P
C308	ECFR1H104ZF	0.1
C310	ECCD1H070C	7P

Ref. No.	Part No.	Value
C401	ECFR1H104ZF	0.1
C402	ECEA0JU470	47
C403	ECKD1H103KB	0.01
C404	ECFR1H104ZF	0.1
C405	ECFR1H104ZF	0.1
C406	ECCD1H220K	22P
C501	ECEV1EV330	33
C502	ECEV1HV010	1
C504	GR426B273K25	0.027
C506	GR426B152K50	0.0015
C507	GR426B104Z25	0.1
C511, 512	ECEA1EN470B	47
C513	ECEA1EN470B	47
C801, 802	ECKD1H391KB	390P
C803, 804	RBP1CN220CT	22
C805, 806	ECKD1H102KB	0.001
C810	ECFR1H104ZF	0.1
C812	ECQV1H104JZ	0.1
C813, 814	ECEA1CN220S	22

● Terminal guide of IC's, transistors and diodes

AN8370S.....42 pin
AN6554NS.....14 pin
MN4416S.....24 pin
AN8376S.....28 pin
MN6636S.....10 pin
AN8290S.....24 pin
MN1550PDT.....18 pin



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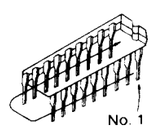
MN15261PDU.....64 pin
SVIPCM54HP.....28 pin



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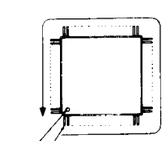
MN6618A.....42 pin



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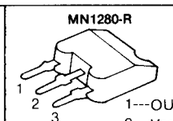

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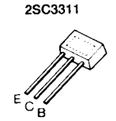

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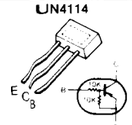

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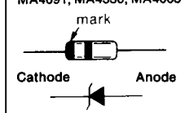
MA4091, MA4330, MA4068



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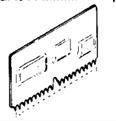
SVIGA011.....5 pin



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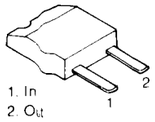

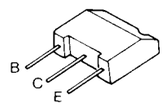

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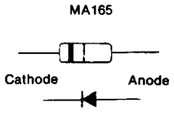
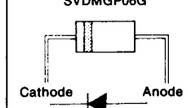
2SB973M
2SC2021M

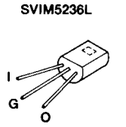
MA165



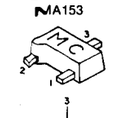
SVDMGP06G



SVIM5236L



MA153



■ REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The "S" mark is service standard parts and may differ from production parts.
5. Ⓚ-marked parts are used for black type only, while ○-marked parts are for silver type only.
6. Part other than Ⓚ-and ○-marked are used for both black and silver types.
7. The parenthesized numbers in the columns of description stand for the quantity per set.

Color

(K)...Black Type
(S)...Silver Type

Color	Areas
(K)	[M].....U.S.A.
(K) (S)	[MC]...Canada.
(K) (S)	[E].....Switzerland and Scandinavia.
(K) (S)	[EK]....United Kingdom.
(K) (S)	[XL]....Australia.
(K) (S)	[EG]...F.R. Germany.
(K) (S)	[EB]....Belgium.
(K) (S)	[EH]...Holland.
(K) (S)	[EF]....France.
(K) (S)	[Ei].....Italy.
(K) (S)	[XA]....Asia, Latin America, Middle Near East, Africa and Oceania.
(K)	[XB]....Saudi Arabia.
(K) (S)	[PA]....East PX.
(K) (S)	[PE]....European Miliary.
(K) (S)	[PC]....European Audio Club.

Ref. No.	Part No.	Description
IC PROTECTORS		
IC1, 2 [EK] only	SVIFU38	IC Protector
IC105 [EK] only	SVIICPN10	IC Protector
FP11 [EK] only	SRUDPF06F6	IC Protector
FP12 [EK] only	SRUDPT08F6	IC Protector
IC11, 12	SVIFU15	IC Protector
INTEGRATED CIRCUITS		
IC13	SVIM5236L	Integrated Circuit
IC101	AN8370S	Integrated Circuit
IC102	MN6636S	Integrated Circuit
IC103, 104	AN6554NS	Integrated Circuit
IC301	MN6617	Integrated Circuit
IC302	MN6618A	Integrated Circuit
IC303	MN4416S	Integrated Circuit
IC304	EHDGA1243	Integrated Circuit
IC401	MN15261PDU	Integrated Circuit
IC402	AN6552	Integrated Circuit
IC403	MN1280−R	Integrated Circuit
IC404	MN1550PDT	Integrated Circuit
IC501	AN8290S	Integrated Circuit
IC802 [M, MC]	SVIHC−MD03M	Integrated Circuit
IC802 [other]	SVIHC−MD01E	Integrated Circuit
IC801	SVIPCM54JP−1	Integrated Circuit
IC802	MN6636S	Integrated Circuit
IC803	AN8376S	Integrated Circuit
IC804, 805	SVIGA011	Integrated Circuit
IC1001	MN1280−S	Integrated Circuit
TRANSISTORS		
Q11	2SD1227M−Q	Transistor
Q12~14	2SB793A−QRS	Transistor
Q15	2SD973A	Transistor
Q16	2SB793A−QRS	Transistor
Q17	2SB642	Transistor
Q101	2SD637	Transistor
Q141	2SD973A	Transistor

Ref. No.	Part No.	Description
TRANSISTORS		
Q142	2SB793A−QRS	Transistor
Q161	2SD973A	Transistor
Q162	2SB793A−QRS	Transistor
Q181	2SD973A	Transistor
Q182	2SB793A−QRS	Transistor
Q402	2SD973A	Transistor
Q403	2SB793A−QRS	Transistor
Q1001	UN4212	Transistor
Q1002	UN4112	Transistor
DIODES		
D11, 12	MA4091−M	Zener
D15, 16	MA4068TA	Zener
D17	MA4330	Zener
D18	MA4082M	Zener
D19~26	⚠ SVDMPG06G	Rectifier
D181, 182, 401~404, 406~413, 415~418	MA165	Diode
D501	MA153	Diode
D1001~1004	MA165	Diode
CRYSTAL		
X301	SVQ16CKSS	16.9344 Hz
RELAY		
RL1001	SFDYG5A237P	Muting
VARIABLE RESISTORS		
VR101	EVND3AA00B53	5kΩ(B)
VR102~105	EVND3AA00B14	10kΩ(B)
VR106	EVND3AA00B53	5kΩ(B)
VR301	EVN38CA00B13	1kΩ(B)
HALL ELEMENTS		
H501, 502	OH−011	Hall Element
FLUORESCENT DISPLAY TUBE		
FL401	SADD3−1	Display
COIL		
L501	NL4532T100K2	10μF
SWITCHES		
S1	⚠ ESB8249V	Power
S2 [XA, XB, PA, PE, PC only]	⚠ SRDSHXW0251	Voltage
S101	SSPD5	Open/Close Detector
S401~408	SSGD1−1	Operation
S411~420	EVQQS405K	Program

Ref. No.	Part No.	Description
POWER TRANSFORMER		
T1 [M, MC]	⚠ SLTD5K022SC	Power Source
T1 [EK, XL]	⚠ SLTD5K024SG	Power Source
T1 [XA, XB, PA, PE, PC]	⚠ SLTD5K025SX	Power Source
T1 [other]	⚠ SLTD5K023SE	Power Source
FUSES		
F1 Except [M, MC]	⚠ XBA2C012TB0S	250V, T125mA
F2 [XA, XB, PA, PE, PC only]	⚠ XBA2C025TB0S	250V, T250mA
COMPONENT COMBINATION		
C2	⚠ EXRFS203ZS	0.01μF×2

Ref. No.	Part No.	Description	
LOADING UNIT PARTS			
1	SIRLP110−KM	Disc Tray Ass'y	(1)
1-1	SHSD13	Sheet	(1)
1-2	SHGD49	Rubber	(1)
4 ○	SGXD170MA0B	Ornament Plate	(1)
4 Ⓚ	SGXD270ZK0B	Ornament Plate	(1)
5	SUSD29−1	Spring	(1)
6	SIRD20	Lever	(1)
7	SIRD16E−1	Holder Ass'y with Rubber	(1)
7-1	SHGD46	Rubber Holder	(1)
9	SUWD46	Bracket	(1)
10	SUXD25	Shaft	(2)
11 ⚠	SOAD30A	Optical Pickup	(1)
12	EWSL04A00000	Holder	(1)
13	SHGD47	Rubber	(1)
14	SORD10E	Coil	(1)
15	EWS7B0A00Q53	Resistance Unit	(1)
16	SOYD8E	Yoke	(1)
17	SOYD9	Yoke	(1)
18	SJGD4E	Motor	(1)
19	SHGD64	Rubber	(1)
20	SHGD48−1	Rubber	(4)
21	SDRD2	Roller	(4)
22	SUWD44	Bracket	(1)
23	SHGD69	Rubber	(1)
24	SOYD2	Yoke	(1)
25	SOMD4	Magnet	(1)
26	SIRD17E	Clamper	(1)
27	SIRD28	Holder	(1)
28	SDGD19	Gear	(1)
29	SDGD20−1	Gear	(1)

Ref. No.	Part No.	Description	
LOADING UNIT PARTS			
31	SDOD8	Ring	(1)
32	SRQA010N04	Spring	(1)
33	SDOD7−1	Turntable	(1)
34	SISD7E	Base	(1)
35	SUSD32−1	Spring (Black)	(1)
36	SUSD43	Spring (Gold)	(1)
37	SUSD44	Spring (Silver)	(1)
38	SUSD42	Spring (Fat Silver)	(1)
39	SMBD2−1	Belt	(1)
40	SHRD23	Lock Shaft	(1)
41	SOMD9A	Rotor	(1)
42	SXPD940	Spindle P.C.B. Ass'y	(1)
43	SHRD19	Lever	(1)
44	SUSD31	Spring	(1)
45	SUSD51	Spring	(1)
CABINET and CHASSIS PARTS			
51 ○	SKCD40SY	Top Case	(1)
51 Ⓚ	SKCD40KZ	Top Case	(1)
52	SUBD5−M	Rod	(1)
53 ○	SBC666	Button	(1)
53 Ⓚ	SBC666−5	Button	(1)
54 ○	SBCD220MA0A	Button	(1)
54 Ⓚ	SBCD220ZK0A	Button	(1)
55	SHRD22−M	Bracket	(1)
56 ○	SGYLP310−SE	Front Panel Ass'y	(1)
56 Ⓚ	SGYLP310−KM	Front Panel Ass'y	(1)
57 [XL] ⚠	SJSD16	AC Socket	(1)
57 [other] ⚠	SJS9236	AC Socket	(1)
58	SWKD110061		
59	SMND7−1	Holder	(1)
60	SJFD4	Terminal	(1)
61 [M]	SGPLP310−KM	Chassis	(1)
61 [MC]	SGPLP310−KMC	Chassis	(1)
61 [E]	SGPLP310−KE	Chassis	(1)
61 [EK]	SGPLP310−KEK	Chassis	(1)
61 [XL]	SGPLP310−KXL	Chassis	(1)
61 [EG]	SGPLP310−KEG	Chassis	(1)
61 [XA, XB]	SGPLP310−KXA	Chassis	(1)
61 [PA, PE, PC]	SGPLP310−KPA	Chassis	(1)
61 [other]	SGPLP310−KEB	Chassis	(1)
63	SRGA008N01	Rubber	(4)
64	QJA0455ZC	Headphones Jack	(1)

Ref. No.	Part No.	Description	
CABINET and CHASSIS PARTS			
65	SMND9−1	Bracket	(1)
66 ○	SBCD360MA	Button	(1)
66 Ⓚ	SBCD360ZK	Button	(1)
CONNECTORS			
71	EMCS0350Z	3 Pin (CN103)	(1)
71	EMCS0550Z	5 Pin (CN402)	(1)
71	EMCS0650Z	6 Pin (CN11)	(1)
71	EMCS0750Z	7 Pin (CN401)	(1)
71	EMCS0552M	5 Pin (CN102)	(1)
72	SJSD1709	17 Pin (CN101)	(1)
73	SJSD0305	3 Pin (CN403)	(1)
74	SJSD0405	4 Pin (CN406, 407)	(2)
75	SRDJ001N14E	Shorting Pin (CN102)	(1)
SCREWS and WASHERS			
N1	SNSD10	Screw	(9)
N2	XTN2+4G	Screw, ⊕2×4	(2)
N3	XQN17+A6	Screw, ⊕1.7×6	(2)
N4	SHDD1−2	Screw	(4)
N5	XTW3+8T	Screw, ⊕3×8	(1)
N6	XXE26D5	Screw	(1)
N7	SNSD9	Screw	(1)
N8	XSN26+6	Screw, ⊕2.6×6	(1)
N9	SFXW120−01	Washer	(1)
N10	XSN26+8	Screw, ⊕2.6×8	(1)
N11	XTN2+5G	Screw, ⊕2×5	(1)
N12 ○	SRXG007N10	Screw	(4)
N12 Ⓚ	SRXG007N51	Screw	(4)
N13	XTV3+8JFYR	Screw, ⊕3×8	(5)
N14	XTV3+8G	Screw, ⊕3×8	(4)
N15	SFXGQ06N01	Screw	(2)
N16	XTV3+8JFZ	Screw, ⊕3×8	(2)
N17	XTV3+8JFZ	Screw, ⊕3×8	(1)
N18	XTV3+10G	Screw, ⊕3×10	(2)
ACCESSORIES			
A1 [M]	SQUD134−1	Instruction Book	(1)
A1 [MC]	SQULP310−KMC	Instruction Book	(1)
A1 [EK]	SQUD136	Instruction Book	(1)
A1 [Ei]	SQUD137	Instruction Book	(1)
A1 [E, EB, EH]	SQULP310−KE	Instruction Book	(1)
A1 [XB]	SQULP310−KXB	Instruction Book	(1)
A1 [PA, PE, PC]	SQULP310−KPA	Instruction Book	(1)
A1 [other]	SQUD135	Instruction Book	(1)

Ref. No.	Part No.	Description	
ACCESSORIES			
A2 [M] ⚠	SJA170−1	AC Cord	(1)
A2 [MC] ⚠	SJA170	AC Cord	(1)
A2 [EK] ⚠	SFDAC05G02	AC Cord	(1)
A2 [XL] ⚠	SJA173	AC Cord	(1)
A2 [XA] ⚠	SJA171	AC Cord	(1)
A2 [XB] ⚠	SJA183	AC Cord	(1)
A2 ⚠ [PA, PE, PC]	SJA168−1	AC Cord	(1)
A2 ⚠ [other]	SJA171	AC Cord	(1)
A3	SJP2249−1	Output Cord	(1)
A4 ⚠ [XB, PA, PE, PC only]	SJP9215	Adaptor	(1)
A5 ⚠ [XA] only	SFDK−I19118	Plug	(1)
PACKING PARTS			
P1 [MC] ○	SPND171	Carton Box	(1)
P1 [EF] ○	SPND112	Carton Box	(1)
P1 ○ [other]	SPND111	Carton Box	(1)
P1 [MC] Ⓚ	SPND105	Carton Box	(1)
P1 [EF] Ⓚ	SPND170	Carton Box	(1)
P1 Ⓚ [other]	SPND92	Carton Box	(1)
P2	SPSD45	Pad	(1)
P3	SPSD46	Pad	(1)
P4	XZB55X40A01	Polyethylene Bag, Unit	(1)
P5	SPSD68	Sheet	(1)
P6	SRHZJ02N01	Polyethylene Bag, Remote Control Unit	(1)
P7	XZB23X20C03	Polyethylene Bag, Cords	(1)

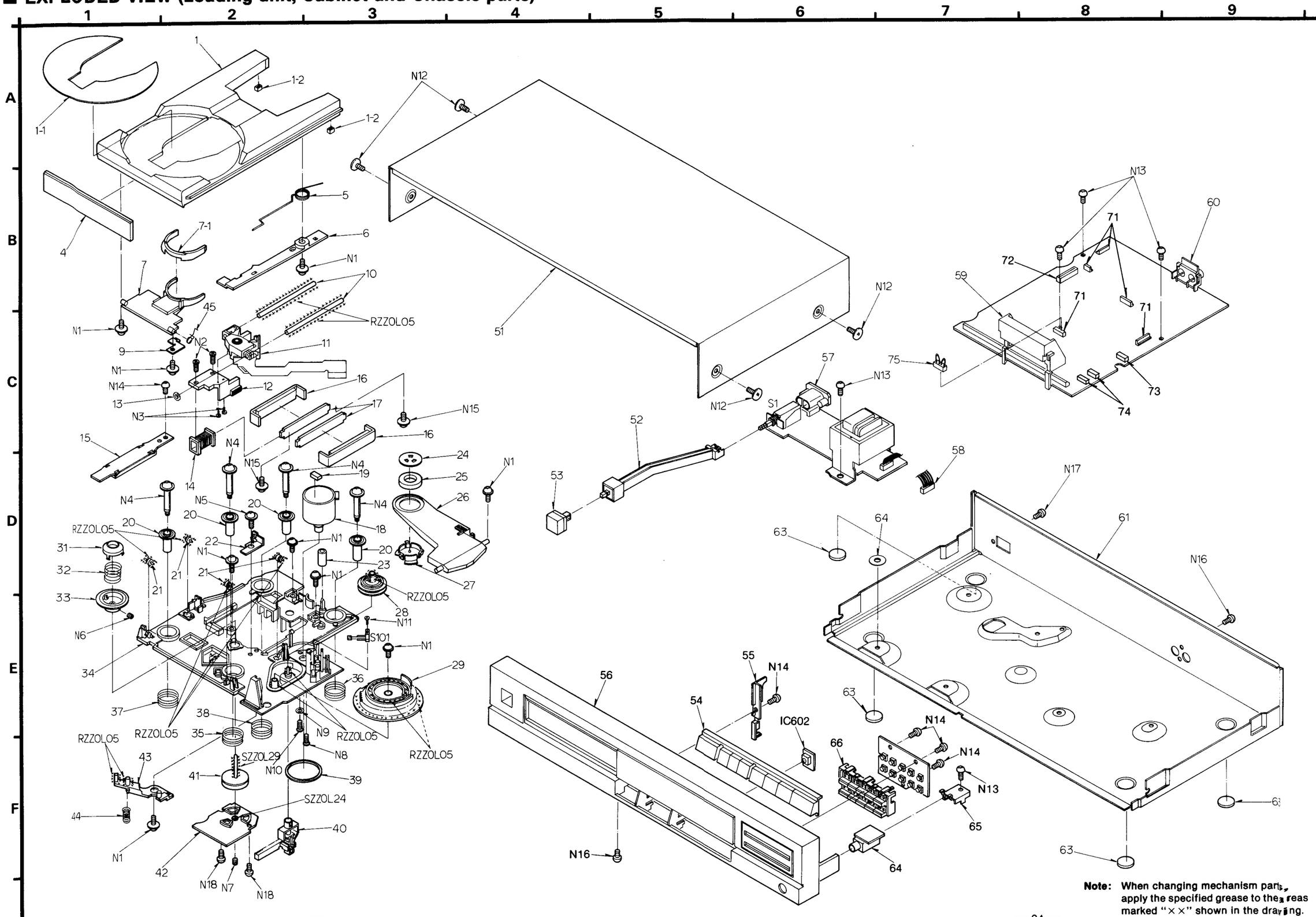
● REMOTE CONTROL UNIT

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1001 [M, MC]	MN6030CA	Integrated Circuit
IC1001 [other]	MN6030B	Integrated Circuit
TRANSISTOR		
Q1001	UN1231	Transistor
DIODES		
D1001	LN66−S	LED
D1002~1005	MA154WK	Diode
D1006, 1007	MA154WA	Diode
CERAMIC OSCILLATORS		
X1001 [M, MC]	CSB455EB1	455KHz
X1001 [other]	CSB420PB1	420KHz
RESISTOR		
R1001	ERDS2TJ1R0	Carbon, 1/4W, 1Ω, ±5%

Ref. No.	Part No.	Description
CAPACITORS		
C1001 [M, MC]	ECKD1H101KB	Ceramic, 50V, 100PF, ±10%
C1001 [other]	ECKD1H471KB	Ceramic, 50V, 470PF, ±10%
C1002 [M, MC]	ECKD1H101KB	Ceramic, 50V, 100PF, ±10%
C1002 [other]	ECKD1H121KB	Ceramic, 50V, 120PF, ±10%
C1003	ECEA0JK101	Electrolytic, 6.3V, 100μF

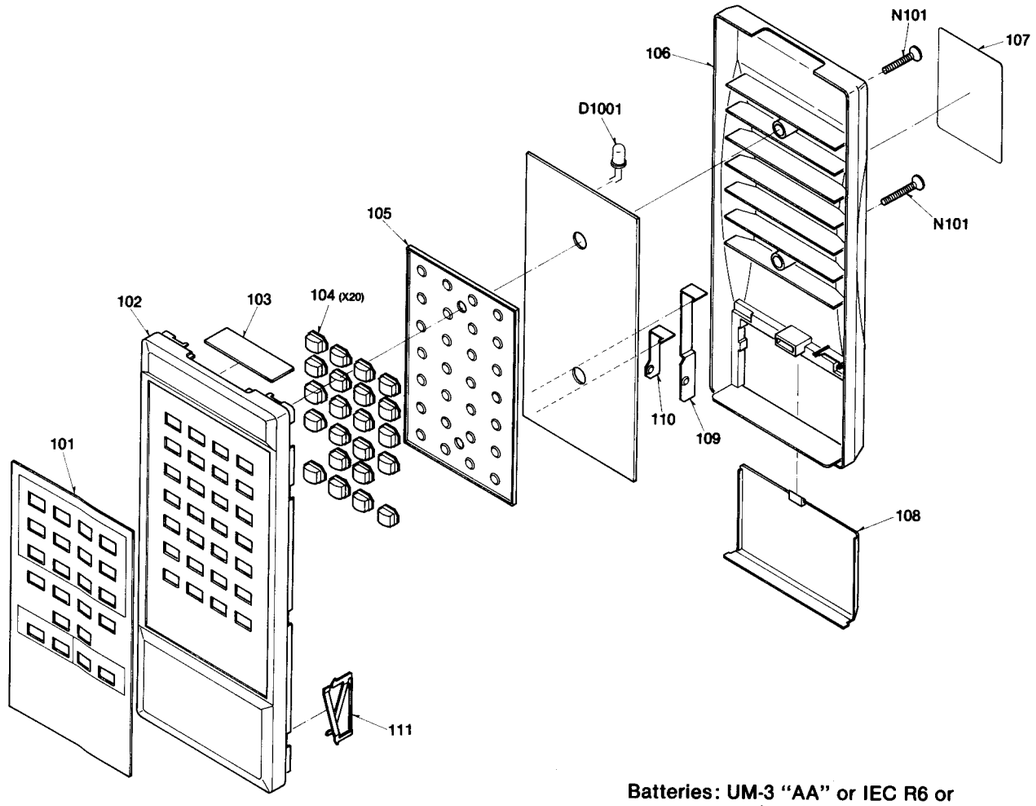
Ref. No.	Part No.	Description	
CABINET and CHASSIS PARTS			
101	UR64PP246	Panel	(1)
102 ○	UR64CS119A	Top Cover	(1)
102 Ⓚ	UR64CS119	Top Cover	(1)
103	UR64SB125	Cover	(1)
104	UR64BT123A	Button	(20)
105	UR64CT122	Rubber, Switch	(1)
106 ○	UR64CS120A	Bottom Cover	(1)
106 Ⓚ	UR64CS120	Bottom Cover	(1)
107	UR64LB126BL	Label	(1)
108 ○	UR64EC121A	Battery Cover	(1)
108 Ⓚ	UR64EC121	Battery Cover	(1)
109	UR64TD128	Terminal ⊖	(1)
110	UR64TD127	Terminal ⊕	(1)
111	UR52TD101	Terminal	(1)
SCREWS			
N101 ○	XTS26+12GFC	Screw, ⊕2.6×12	(2)
N101 Ⓚ	XTS26+12GFZ	Screw, ⊕2.6×12	(2)

■ EXPLODED VIEW (Loading unit, Cabinet and Chassis parts)



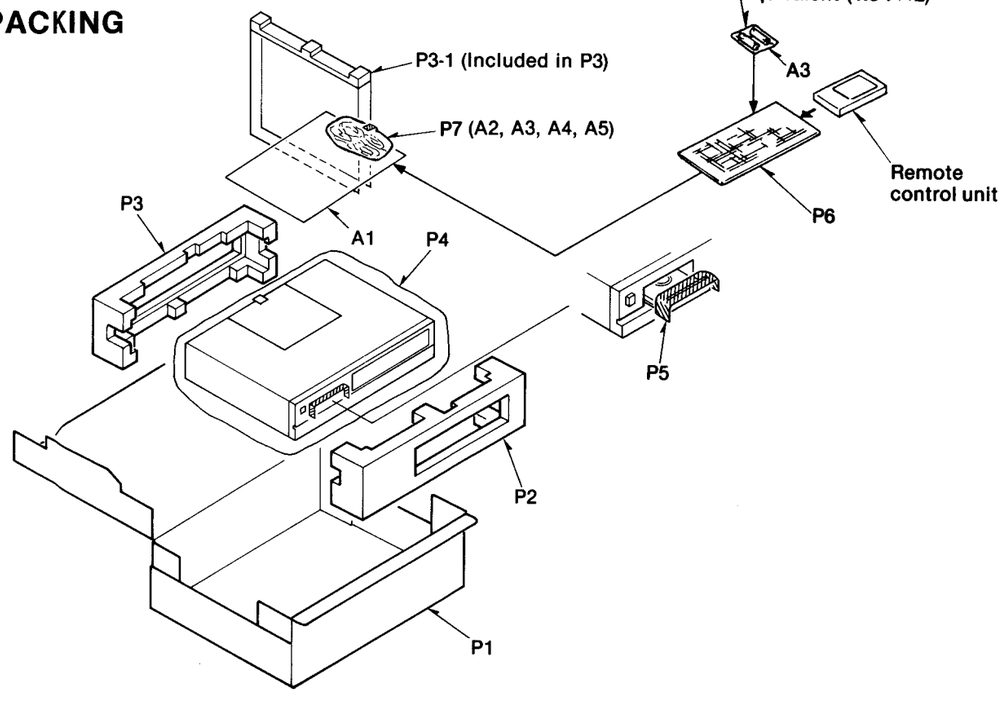
Note: When changing mechanism parts, apply the specified grease to the areas marked "××" shown in the drawing.

■ EXPLODED VIEW (Remote control parts)



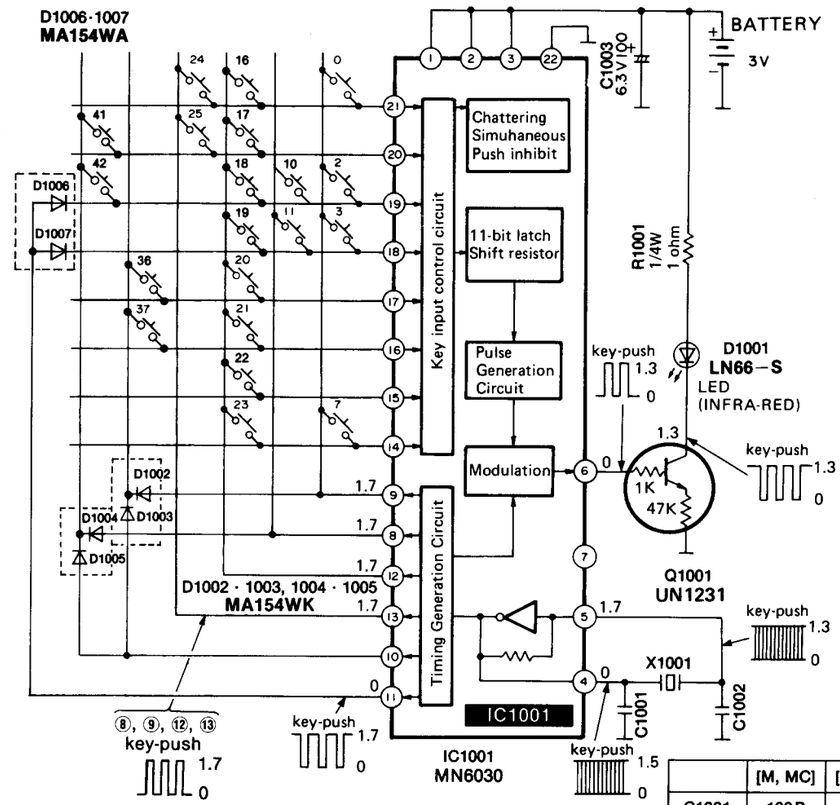
Batteries: UM-3 "AA" or IEC R6 or equivalent (1.5V×2)

■ PACKING



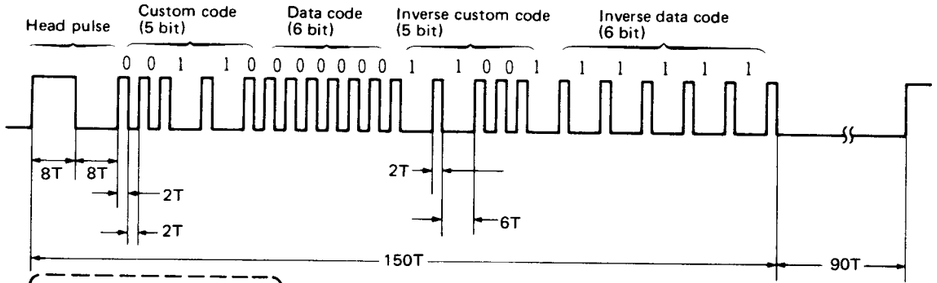
■ SCHEMATIC DIAGRAM OF REMOTE CONTROL UNIT

Key No.	Function
0	Stop
2	Skip/search ⏮
3	Skip/search ⏭
7	Repeat
10	Play/pause
11	Clear
16	Numeric 1
17	Numeric 2
18	Numeric 3
19	Numeric 4
20	Numeric 5
21	Numeric 6
22	Numeric 7
23	Numeric 8
24	Numeric 9
25	Numeric 0
36	Level Up ▲
37	Level Down ▼
41	Time Mode
42	Memory

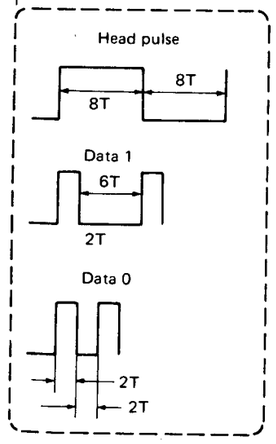


	[M, MC]	[others]
C1001	100P	470P
C1002	100P	120P

• Key number description and data code



★1T = 0.420ms~0.424ms (U.S.A. and Canada)
1T = 0.454ms~0.460ms (Europe and Others)



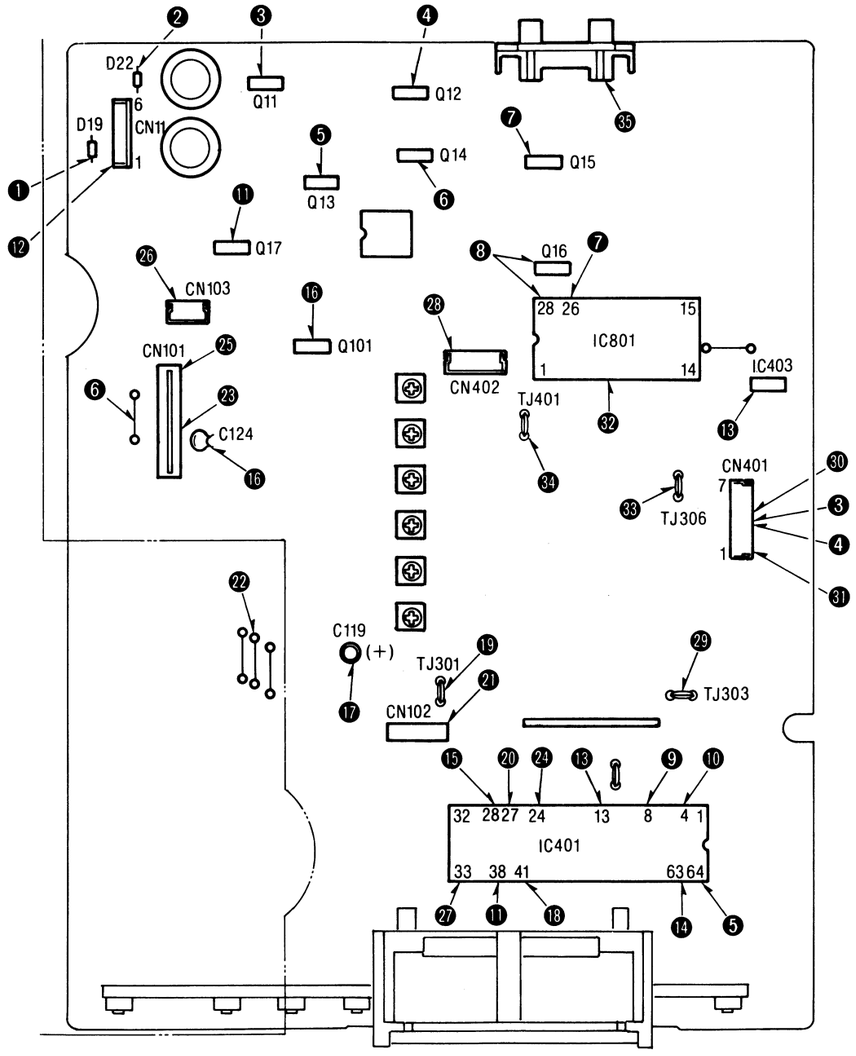
Key No.	Function	Data Code	Key No.	Function	Data Code
0	Stop	000000	20	Numeric 5	001010
2	Skip/search ⏮	010000	21	Numeric 6	101010
3	Skip/search ⏭	110000	22	Numeric 7	011010
7	Repeat	111000	23	Numeric 8	111010
10	Play/pause	010100	24	Numeric 9	000110
11	Clear	110100	25	Numeric 0	100110
16	Numeric 1	000010	36	Level Up ▲	001001
17	Numeric 2	100010	37	Level Down ▼	101001
18	Numeric 3	010010	41	Time Mode	100101
19	Numeric 4	110010	42	Memory	010101

■ TROUBLESHOOTING

Notes:

1. Carefully handle the compact disc because stains, dust or warping may cause generation of noise.
2. For the voltage value and waveform, refer to the schematic diagram. (The voltage value and waveform slightly varies depending on the measuring set and tester.)
3. Possible defects are mainly shown by the name of semi-conductor. The adjacent electronic circuits (such as C and R) are omitted.

• Check points



• Check the power supply circuit

Check point ❶

Check the voltage of terminal D19 (cathode).....8.9V — NO → AC cord, S1, T1, D19, 20 } defective

Check point ❷ YES

Check the voltage of terminal D22 (anode).....⊖9.3V — NO → D21, D22 } defective

Check point ❸ YES

Check the voltage of terminal Q11 (emitter) or CN401, pin 4.....8.5V — NO → IC11, Q11, D11 } defective

Check point ❹ YES

Check the voltage of terminal Q12 (emitter) or CN401, pin 3.....⊖8.5V — NO → IC12, Q12, D12 } defective

Check point ❺ YES

Check the voltage of terminal Q13 (collector) or IC401, pin 64.....5V — NO → IC13, Q13 } defective

Check point ❻ YES

Check the voltage of terminal Q14 (emitter) or jumer wire.....⊖5V — NO → IC402, Q14 } defective

Check point ❼ YES

Check the voltage of terminal Q15 (emitter) or IC801, pin 26.....6.5V — NO → Q15, D15 } defective

Check point ❽ YES

Check the voltage of terminal Q16 (emitter) or IC801, pin 28.....⊖6.5V — NO → Q16, D16 } defective

Check point ❾ YES

Check the voltage of IC401, pin 8.....12.5V — NO → D23, D24 } defective

Check point ❿ YES

Check the voltage of IC401, pin 4.....⊖12V — NO → D24, D25 } defective

Check point ⓫ YES

Check the voltage of terminal Q17 (emitter) or IC401, pin 38.....⊖32V — NO → D18, D25, D26, Q17 } defective

Check point ⓬ YES

Check the voltage of CN11 ①, ②..... AC 2.3V — NO → T1, D18 } defective

• Check the focus servo

Check the power supply circuit

Check point ⓭ YES

Reset signal is "H (4.2V)"? (IC403, pin 1 or IC401, pin 13) — NO → IC402 de

Check point ⓮ YES

Clock is oscillating (4.2336MHz)? (IC401, pin 63) — NO → IC301, X30 R407, C40

Check point ⓯ YES

Focus ON signal level is "L (0V)"? (IC401, pin 28) — NO → IC401, IC101

Check point ⓰ YES

Laser A.P.C. signal is ON? (Q101 collector or C124) — NO → IC101, Q101

Check point ⓱ YES

Focus search signal is emitted? (IC101, pin 35 or C119) — NO → IC101 d

Check point ⓲ YES

Focus OK signal is "L (0V)"? (IC401, pin 31) — NO → IC101, IC401

YES

Focus lens moves up and down for a few seconds? (Not needed to set the disc) — NO → IC104, Q141, 142, Pickup

Check point ⓳ YES

RF signal is emitted? (Test pin TJ301) — NO → IC101, Pickup

• Check the tracking servo

Check point ⓴

Check the TR ON signal (IC401 27 pin). "L" in play and "H" in search/skip. — NO → IC101, IC401

Check point ㉑ YES

Tracking error signal is emitted? (CN102, pin 1 or pin 2) — NO → IC101 d

Check point ㉒ YES

Track jump pulse is emitted during search/skip? (IC101, pin 20 or jumper wire) — NO → IC101 d

Check point ㉓ YES

Tracking coil drive signal is emitted? (CN101, pin 8) — NO → IC104, Q161, Q162

o

cuit

3)

NO → IC402 defective

MHz)?

NO → IC301, X301, R407, C403 } defective

(0V)"?

NO → IC401, IC101 } defective

NO → IC101, Q101 } defective

ed?

NO → IC101 defective

NO → IC101, IC401 } defective

wn for a few

NO → IC104, Q141, 142, Pickup } defective

NO → IC101, Pickup } defective

vo

01 27 pin).
n/skip.

NO → IC101, IC401 } defective

ed?

NO → IC101 defective

luring
jumper wire)

NO → IC101 defective

mitted?

NO → IC104, Q161, Q162 } defective

• Check the traverse servo

Check point ㉔

Kick pulse is emitted in skip mode? (IC401, pins 23, 24)

NO → IC401 defective

YES

Check point ㉕

Traverse coil drive signal is emitted? (CN101, pin 17)

NO → IC103, Q181, Q182 } defective

YES

Check point ㉖

Speed sensor singnal is emitted? (CN103, pin 3)

NO → Speed sensor } defective

• Check the loading motor drive

Check point ㉗

Loading motor close/open command signal is emitted? (IC401, pins 33, 34)

NO → IC401 defective

YES

Check point ㉘

Loading motor drive signal is emitted? (CN402, pin 5)

NO → IC402, Q402, 403, motor } defective

• Check the digital and audio

Check point ㉙

PCK signal is emitted? (Test pin TJ303)

NO → IC304, IC301 } defective

YES

Check point ㉚

CLK signal is emitted? (CN401, pin 5)

NO → IC301 defective

YES

Check point ㉛

Spindle motor ON command signal is "H (2.5V)"? (CN401, pin 1)

NO → IC301 defective

YES

Check point ㉜

Data signal is emitted? (IC801, pins 2, 3, 5~18)

NO → IC301, 302, IC801 } defective

YES

Check point ㉝

Deglitch signal is emitted? (Test pin TJ306)

NO → IC301, IC302 } defective

YES

Check point ㉞

Muting signal level is "L (0V)"? (Test pin TJ401)

NO → IC401, IC803 } defective

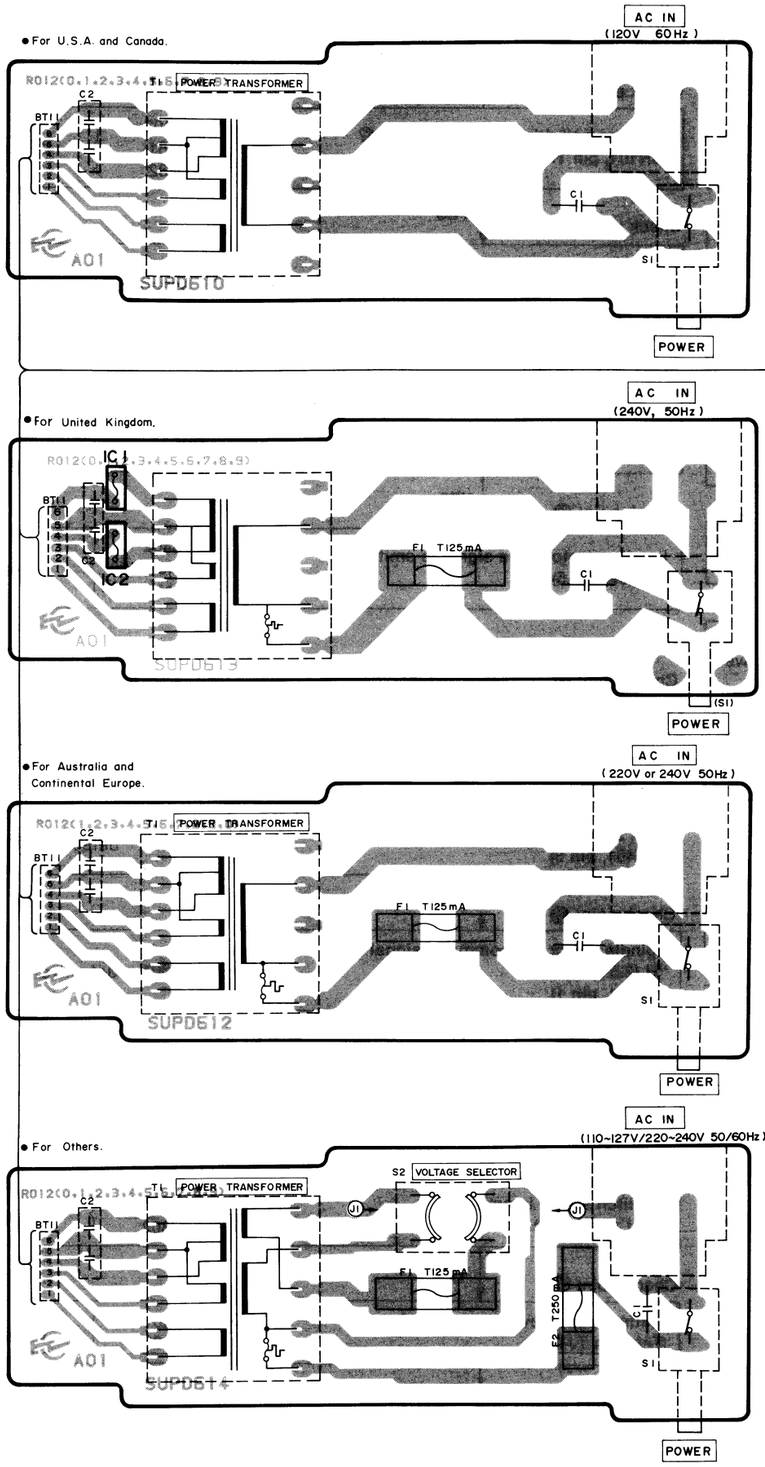
YES

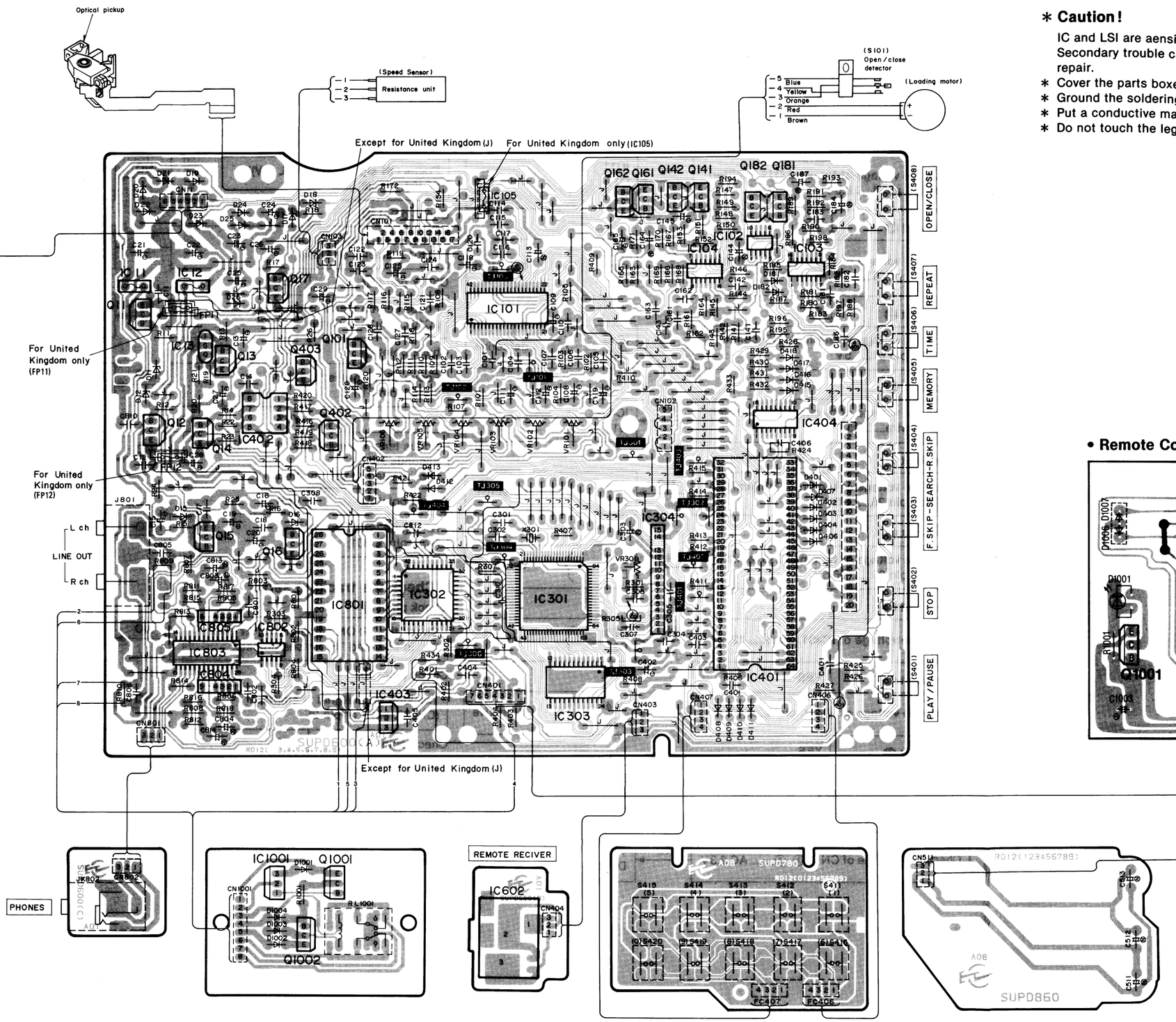
Check point ㉟

AF signal is emitted? (Output terminal)

NO → IC802~804 defective

■CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM





*** Caution!**

IC and LSI are aensi
Secondary trouble ca
repair.

* Cover the parts boxe
* Ground the soldering
* Put a conductive ma
* Do not touch the leg

• Remote Co

* Caution!

IC and LSI are aensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

* Cover the parts boxes made of plastics with aluminum foil.
* Ground the soldering iron.
* Put a conductive mat on the work table.
* Do not touch the legs of IC or LSI with the fingers directly.

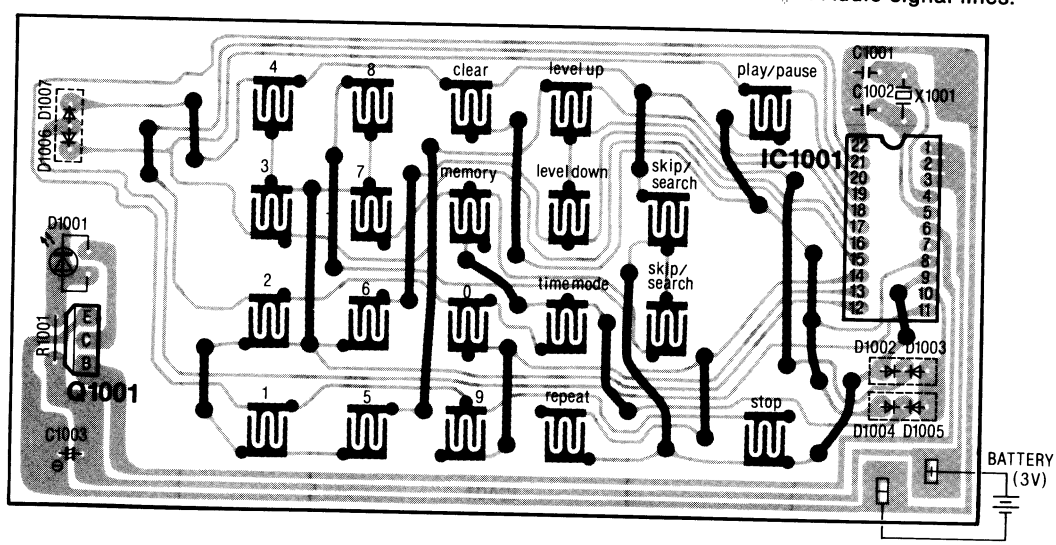
■ SCHEMATIC DIAGRAM

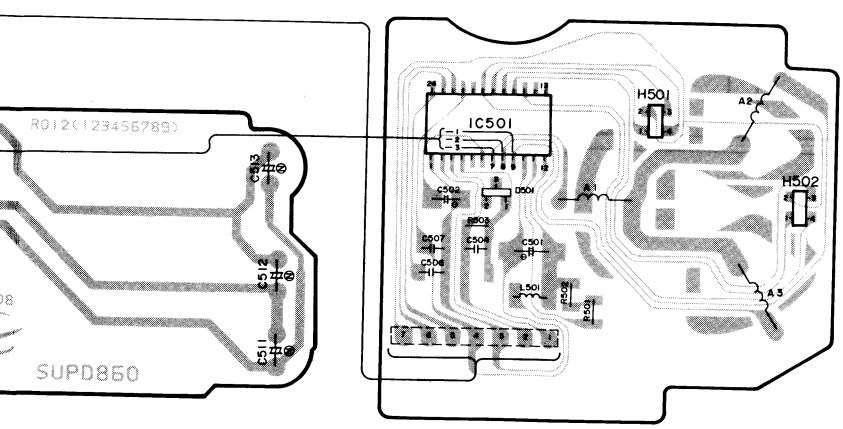
(This schematic diagram may be modified at any time with the development of new technology.)

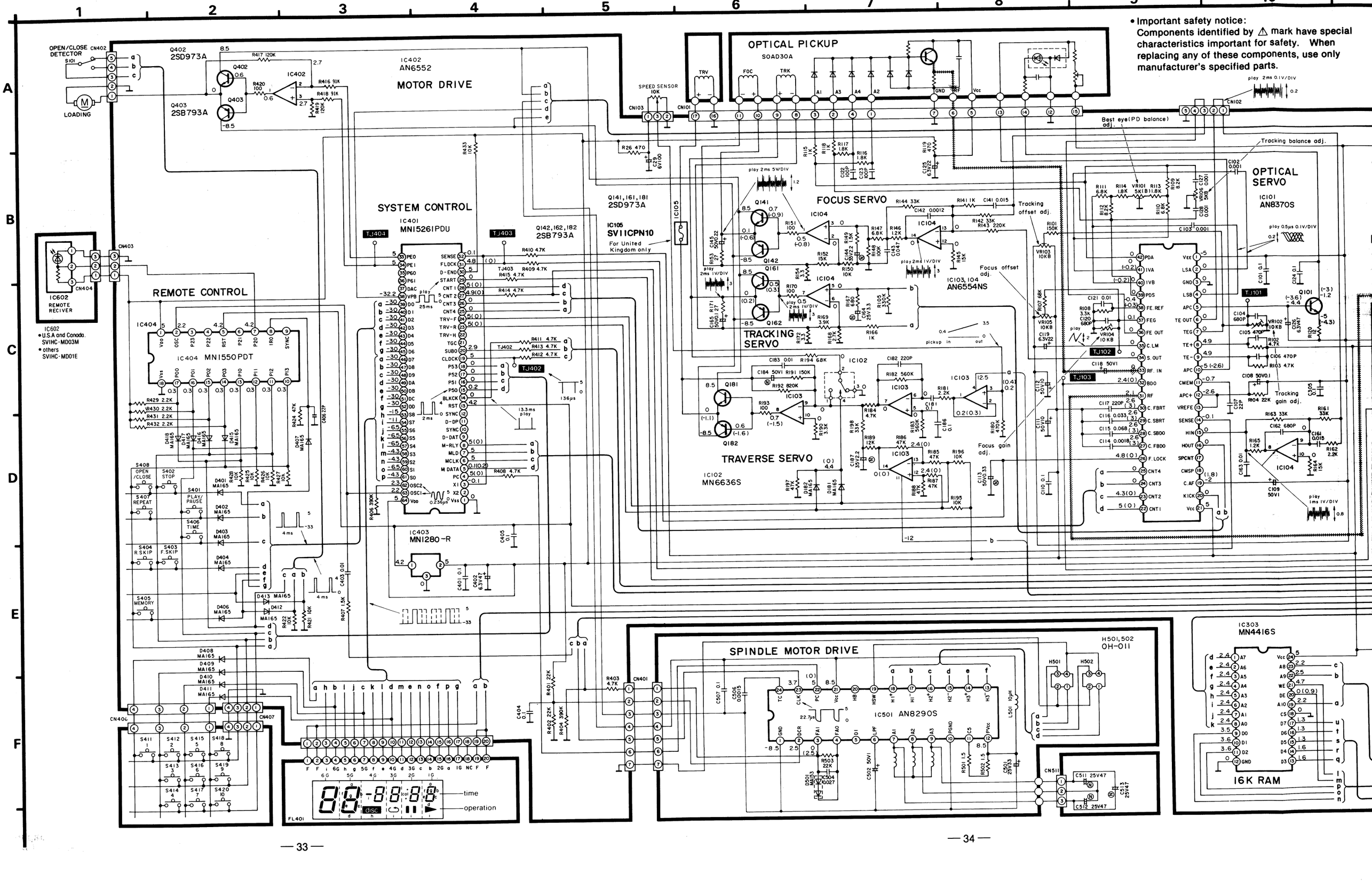
Notes:

1. **S1** : Power switch in "**on**" position.
2. **S2** : Voltage selector switch. (For [XA], [XB], [PA], [PE] and [PC] areas)
3. **S101** : Disc holder open/close detection switch.
4. **S401** : Play/pause switch.
5. **S402** : Stop/clear switch.
6. **S403** : Forward skip/search switch.
7. **S404** : Backward skip/search switch.
8. **S405** : Memory/recall switch.
9. **S406** : Time mode select switch.
10. **S407** : Repeat switch.
11. **S408** : Open/close switch.
12. The voltage value and waveform are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
    * The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
13. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
14. ——— : Positive voltage lines and negative voltage lines.
    ▒▒▒ : Audio signal lines.

• Remote Control






• Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
OPTICAL PICKUP
SOAD30A
OPEN/CLOSE DETECTOR
LOADING
MOTOR DRIVE
IC402
AN6552
SPEED SENSOR
SYSTEM CONTROL
IC401
MN1526IPDU
IC105
SV11CPN10
For United Kingdom only
FOCUS SERVO
TRACKING SERVO
TRAVERSE SERVO
IC102
MN6636S
OPTICAL SERVO
IC101
AN8370S
IC103, 104
AN6554NS
REMOTE CONTROL
IC602
REMOTE RECIVER
• U.S.A and Canada. SVIHC-MD03M
• others SVIHC-MD01E
IC404 MN1550PDT
IC403
MN1280-R
SPINDLE MOTOR DRIVE
IC501 AN8290S
H501,502
OH-011
IC303
MN4416S
16K RAM
FL401
time
operation
Tracking balance adj.
Best eye(PD balance) adj.
Tracking offset adj.
Focus offset adj.
Focus gain adj.
Tracking gain adj.
— 33 —
— 34 —

Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

• ——— : Positive voltage lines and negative voltage lines.
▒▒▒ : Audio signal lines.

OPTICAL SERVO
IC101 AN8370S

POWER SOURCE
IC402 AN6552
IC13 SVIM5236L
Q11 2SD1227M
Q12~14 2SB793A
Q17 2SB642
Q16 2SB793A
Q15 2SD973A
Q101 2SD637
IC304 EHDGA1243
FP11 SRUDPF06F6
FP12 SRUDPF08F6
IC11,12 SVIFUI5

DATA SLICE AND PLL
IC304

DIGITAL SIGNAL PROCESSING

IC303 MN4416S
16K RAM

IC302 MN6618A
DIGITAL FILTER

IC301 MN6617

IC801 SVIPCM54JP-1
D/A CONVERTER

IC802 MN6636S
DIGLITCH

IC805 SVIGA011 FILTER

IC803 AN8376S AUDIO

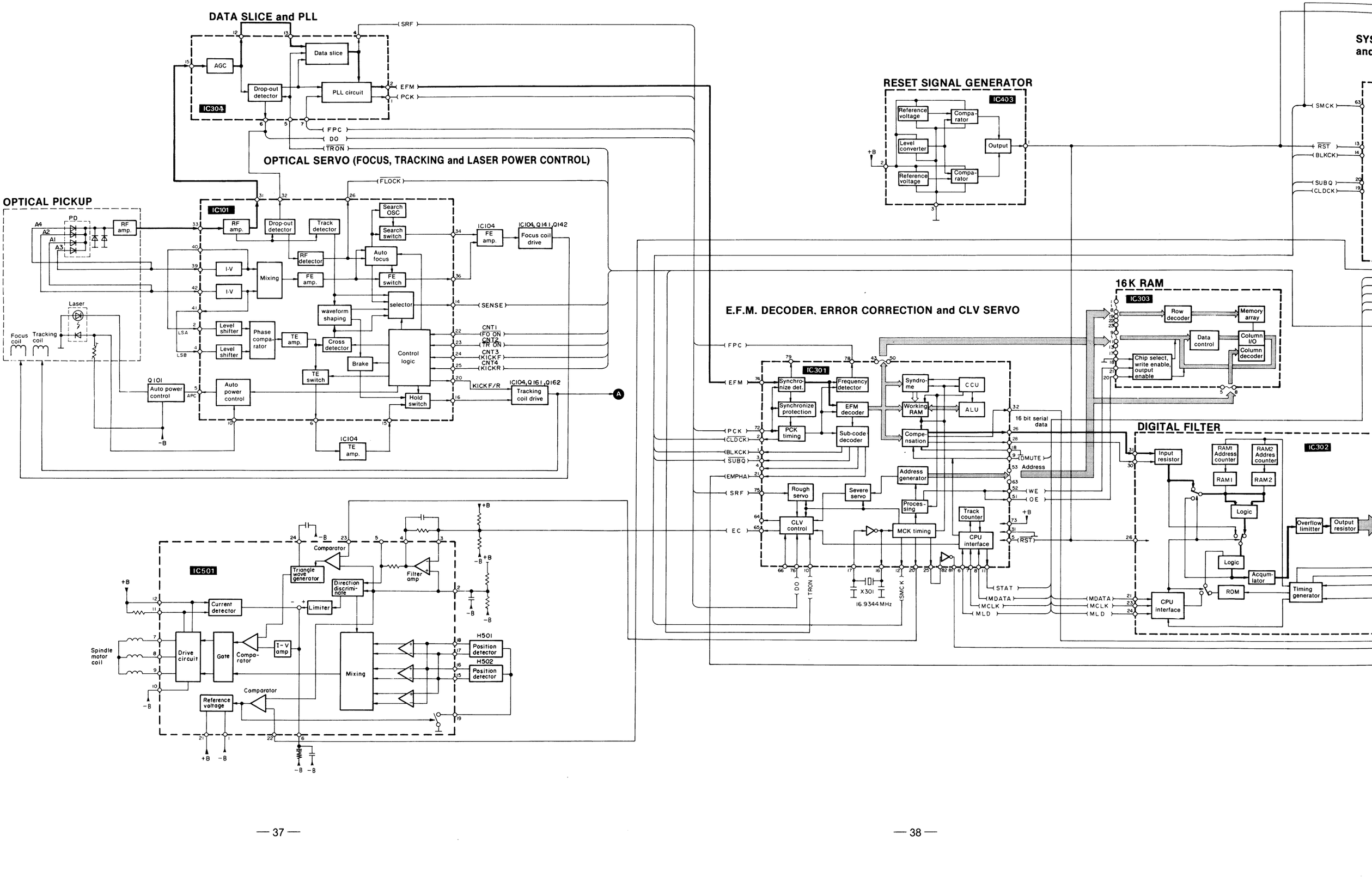
IC804 SVIGA011 FILTER

MUTING
Q1002 UN4112
Q1001 UN4212
IC1001 MN1280-S

POWER SUPPLY
For U.S.A. and Canada.
For United Kingdom only
For Continental Europe, United Kingdom and Australia.
For others

LINE OUT
PHONES

■ BLOCK DIAGRAM



SYSTEM CONTROL and FL DRIVE

IC401
CLOCK GEN.
ROM 6144 x 8
IR
PC
DISPLAY CONTROL
SP X SX SY SE Y 320 x 4 BANK
HALT/ STOP
SBT
SB
INT. FLAG
INT. EN. FLAG
CF ZF
ALU
TC
TB
BC
SYSTEM CONTROL
E
A
DAC
LB

SMCK 63
RST 13
BLKCK 14
SUBQ 20
CLDCK 19
PC
MDATA
MCLK
MLD
DMUTE
STAT
FLOCK
SENSE
CLOSE
OPEN
CNT4
CNT3
CNT2
CNT1

SI01 Open/close detector
KEY MATRIX
F L

REMOTE CONTROL DATA PROCESSING

IC404
CLOCK GEN.
ROM 1024 x 8
IR
PC (10)
HALT/ STOP
SP Y (4) X (4) SX SY SE 96 x 4
LB
SBT
SB
INT. FLAG
INT. EN. FLAG
CF ZF
ALU
TC
TB
BC
SYSTEM CONTROL
E(4)
A(4)
LB

SMCK 2
RST 5

MOTOR DRIVE

IC402 Logic
Q402, 403 Motor drive
Loading motor (M)

TRAVERSE SERVO

IC102
IC103 Traverse servo
Traverse coil drive IC103, Q181, 182
Traverse coil
IC103 Speed detector
+B

POWER SUPPLY

IC402 12.5V
IC801~803, Q801 6.5V
IC501, Q141, Q601, Q181, Q402 8.5V
IC101~104, IC301 304, IC401, IC403 IC404, Q803, Pickup, 5V
Q15 Regulator
IC13 Regulator
Q13 Regulator
Q11 Regulator
IC11 IC Protector
D23 Rectifier
D19,20 Rectifier
D21,22 Rectifier
D24 Rectifier
D26 Rectifier
Power transformer (T1)
(S1) AC IN

IC402 Regulator
Q14 Regulator
Q12 Regulator
IC12 IC Protector
IC101, 103, 104, 304 Q101, Pickup -5V
IC501, Q142, Q162, Q182, Q403 -8.5V
IC801, 803 -6.5V
Q16 Regulator
IC402 -12V
IC401 -32V
Q17 Regulator
D18
FL401 AC2.3V

RAM

Row decoder
Memory array
Data control
Column I/O
Column decoder
Chip select, Write enable, Output enable

DIGITAL FILTER

IC302
Input resistor
RAM1 Address counter
RAM2 Addres counter
RAM1
RAM2
Logic
Logic
Overflow limitter
Output resistor
Acqum- lator
ROM
Timing generator
CPU interface

D/A CONVERTER

IC801
Ladder resistor network
I-V
IC802
IC802
IC805
IC803
IC804
L ch
Rch
LINE OUT
Headhone

Q1001, 1002 Relay drive
Relay

IC602 Remote control reciver

REMOTE CONTROL TRANSMITTER

3V
Q1001 LED drive
Modulation
Pulse generator
11 Bit latch
Chattering simuldepression inhibit
Timing generation circuit
Key input control circuit
IC1001
1, 2, 3
3V
Key switch

Printed in Japan
860809500 (H) AM

Adjustment Manual

1. ADJUSTMENT PROCEDURE

Refer to the service manual for the disassembling methods of each parts.

Note
Avoid the direct entrance of laser rays into the eyes and exposure of the body to laser rays which are dangerous. Especially be careful during the electric and optical pick-up adjustments, because a laser beam is radiated from the lens of the optical pick-up when the power supply is turned on. Follow the adjusting procedure in the manual.

1-1. Preparation for Electric Adjustments

① Remove the cabinet, and front panel.
② Remove the power switch rod.
③ Release the optical pick-up lock by pressing in the lock shaft located at the bottom (■ (Lock) → ▬ (Free)). See Fig. 1 below.

(Note 1)
The pick-up detects signals recorded on the disc with a laser beam. The pick-up moves as the programs are played back but the movement is not visible from the outside.

Caution:

- Be sure to remove a disc from the player and lock the pick-up by pressing in the lock shaft, when the player is transported or disassembled. Otherwise, the disc loading mechanism is shifts and can be damaged.

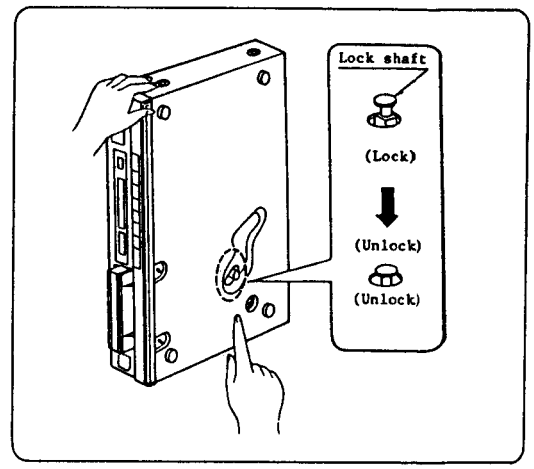
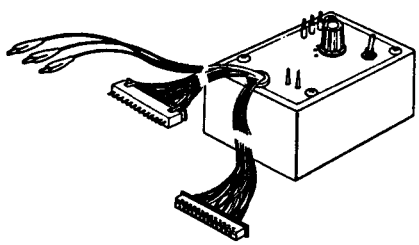


Fig.1 Lock Shaft

1-2. Measuring Instruments and Special Tools

Special tools are required prior to starting electric and optical pick-up adjustments.
The special tools are available through the ordinary part supply route.

1. Servo gain adjuster (SZZP1017F)



2. Test disc

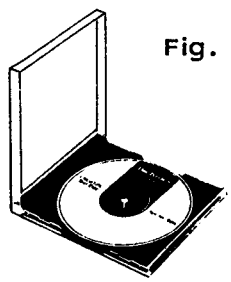
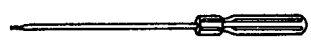


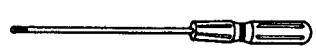
Fig. 2

- Test disc (SZZP1014F) old type
- Test disc (SZZP1014F) new type
- Inspection test disc (SZZ1054C)
- Uneven disc (SZZP1056C)
- Black band disc (SZZP1057C)

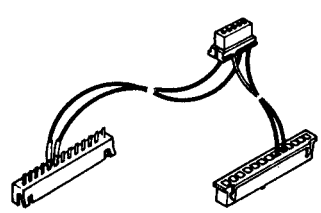
6. Adjusting screwdirver (SZZP1043C)



7. Allen wrench (1.5 mm) (SZZP1044C)

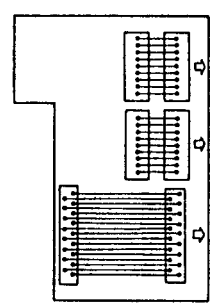


8. Conversion connector (SZZP1032F)

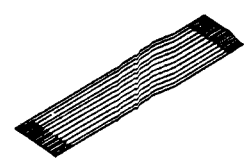


3. Ordinary disc
4. 2-channel oscilloscope (with external trigger more than 30MHz)
5. Low frequency oscillator
6. Adjusting screwdriver --SZ ZP1043C
7. Allen wrench --------SZ ZP1044C
9. General servicing tools

10. Junction PCB (SZZP1070C)



11. Junction F PC cord (SZZP1071C)



- **TEST DISC (SZZP1014F) old type**
- TESTDISK (SZZP1014F); alte Ausführung
- DISQUE D'ESSAI (SZZP1014F) - ancien type
- PRUEBA DE DISCO (SZZP1014F) tipo antiguo

Contents

TR	PURPOSE	SIGNAL	Time
		(TOC)	
1	Servo adjustment	Wobble Tone - 10dB L+R	2'00"
2	Pickup assymetry adjustment	Wobble Tone -10dB L+R	5'00"
3	Reference	1 kHz 0 dB L+R	1'00"
4	Freq. Response	20kHz 0 dB L+R	0'30"
5	Emphasis	16 kHz -0.96 L+R	0'30"
6	Channel Separation	L 1kHz 0 dB R-∞	0'30"
7	Channel Separation	R 1kHz 0 dB L-∞	0'30"
8	Dynamic range	1 kHz -60 dB L+R	1'00"
9	Linearity	1 kHz -80 dB L+R	1'00"
10	S/N	- ∞	2'00"
11	THD	1 kHz 0 dB L+R	1'00"
12	Black Spot	Wobble Tone -10 dBL+R	5'00"
13	Black Spot	Wobble Tone -10 dBL+R	5'00"
14	Finger Print	Wobble Tone -10 dBL+R	5'00"
15	Finger Print	Wobble Tone -10 dBL+R	9'00"
16	Wedge	Wobble Tone -10 dBL+R	4'00"
17	Wedge	Wobble Tone -10 dBL+R	4'00"
18	Reference	1 kHz 0 dB L+R	0'30"

TR	PURPOSE	SIGNAL	Time
19	Freq. Response	15 Hz	0'30"
20	Freq. Response	20	0'30"
21	Freq. Response	50	0'30"
22	Freq. Response	100	0'30"
23	Freq. Response	200	0'30"
24	Freq. Response	500	0'30"
25	Freq. Response	2K	0'30"
26	Freq. Response	5K	0'30"
27	Freq. Response	10K	0'30"
28	Freq. Response	12K	0'30"
29	Freq. Response	15K	0'30"
30	Freq. Response	18K	0'30"
31	Freq. Response	20K	0'30"
32	Channel Separation	L 100Hz 0 dB R - ∞	0'30"
33	Channel Separation	R 100Hz 0 dB L - ∞	0'30"
34	Channel Separation	L 10kHz 0 dB R - ∞	0'30"
35	Channel Separation	R 10kHz 0 dB L - ∞	0'30"
36	Channel Separation	L 20kHz 0 dB L - ∞	0'30"
37	Channel Separation	R 20kHz 0 dB L - ∞	

* This old type test disc has been changed to new type (CDT-002)
* This old type test disc has 37 tracks and display shows 37 tracks when this disc is played

* Characteristics of old type and new type (CDT-002) are identical. Both disc can be used for same purpose.

- **TEST DISC (SZZP1014F) new type**
- TESTDISK (SZZP1014F); neue Ausführung
- DISCHE D'ESSAI (SZZP1014F) - nouveau type
- PRUEBA DE DISCO (SZZP1014F) tipo nuevo

Contents

TR	PURPOSE	SIGNAL	Time
1	Reference	1 kHz L+R 0dB	1'40"
2	S/N	1 kHz L+R -	1'40"
3	Separation	1 kHz L 0dB	1'40"
4	Separation	1 kHz R 0dB	1'40"
5	Dynamic Range	1 kHz L+R -24dB	1'40"
6	Emphsis	16kHz L+R 0dB	1'40"
7	Black Band 0.4 mm	400Hz L+R -10dB	3'00"
8	Black Band 0.5 mm	400Hz L R -10dB	2'30"
9	Wedge 0.7 mm	400Hz L+R -10dB	5'00"
10	Fingerprint No.3	400Hz L+R -10dB	2'00"
11	Index	1.440Hz L+R -10dB 2.880Hz L+R -10dB 3.1760Hz L+R -10dB	8'00" 8'00" 1'00"
12	Repeat check	1 kHz L+R 0dB	0'05"

- **INSPECTION TEST DISC (SZZP1054C) CDT-016**
- INSPEKTIONSDISK (SZZP1054C) CDT-016
- DISQUE D'ESSAI D'INSPECTION (SZZP1054C)CDT-016
- DISCO DE PRUEBA DE INSPECCION (SZZP1054C)CTD-016

Contents

TR	PURPOSE	SIGNAL	Time
1	Reference	1 kHz L+R 0dB	1'00"
2	Reference	400Hz L+R 0dB	1'40"
3	Wedge 0.4 mm	400Hz L+R -10dB	2'10"
4	Wedge 0.5 mm	400Hz L+R -10dB	2'20"
5	Wedge 0.6 mm	400Hz L+R -10dB	2'20"
6	Wedge 0.7 mm	400Hz L+R -10dB	2'40"
7	Wedge 0.8 mm	400Hz L+R -10dB	2'40"
8	Wedge 0.9 mm	400Hz L+R -10dB	3'10"
9	Black dot 0.3 mm	400Hz L+R -10dB	3'55"
10	Black dot 0.4 mm	400Hz L+R -10dB	4'10"
11	Black dot 0.5 mm	400Hz L+R -10dB	4'20"
12	Black dot 0.6 mm	400Hz L+R -10dB	5'05"
13	Black dot 0.7 mm	400Hz L+R -10dB	5'10"
14	Black dot 0.8 mm	400Hz L+R -10dB	6'05"
15	Black dot 0.9 mm	400Hz L+R -10dB	9'45"

- **UNEVEN DISC (SZZP1056C)**

Structure : Ordinary disc with small piece for uneveness
Usage : Optical pick up mechanical adjustment

- **BLACK BAND DISC (SZZP1057C)**

Structure : Ordinary disc with 0.5 mm width tape at both side
Usage : Adjustment for regular size FF1 CD player

(1) Tracking offset adjustment
(2) Focus offset adjustment

2. ADJUSTMENT AND TEST POINT LOCATIONS
2. EINSTELLUNG UND LAGE DER MESSPUNKTE
2. RÉGLAGE ET EMPLACEMENTS DES POINTS DE MESURE
2. POSICION DEL AJUSTE Y EL PUNTO DE PRUEBA

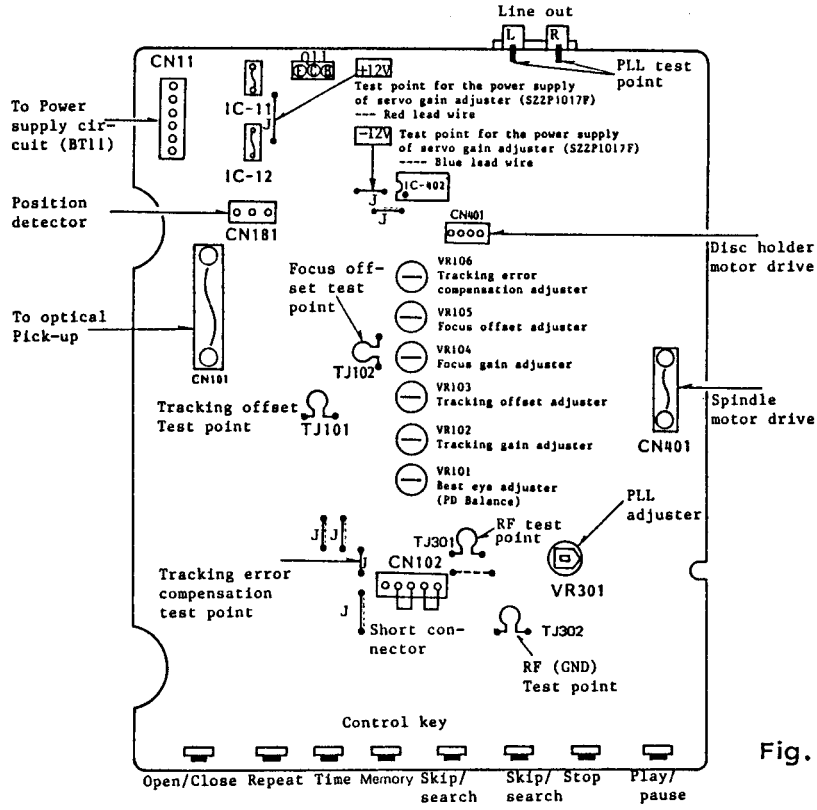


Fig. 3 Main circuit

2-1. Servo gain adjuster and its connection
2-1. Servo-Verstärkungsregler mit Anschluß
2-1. Ajusteur de l'amplification asservie et son raccordement
2-1. Ajustador de ganacia de servo y su conexión

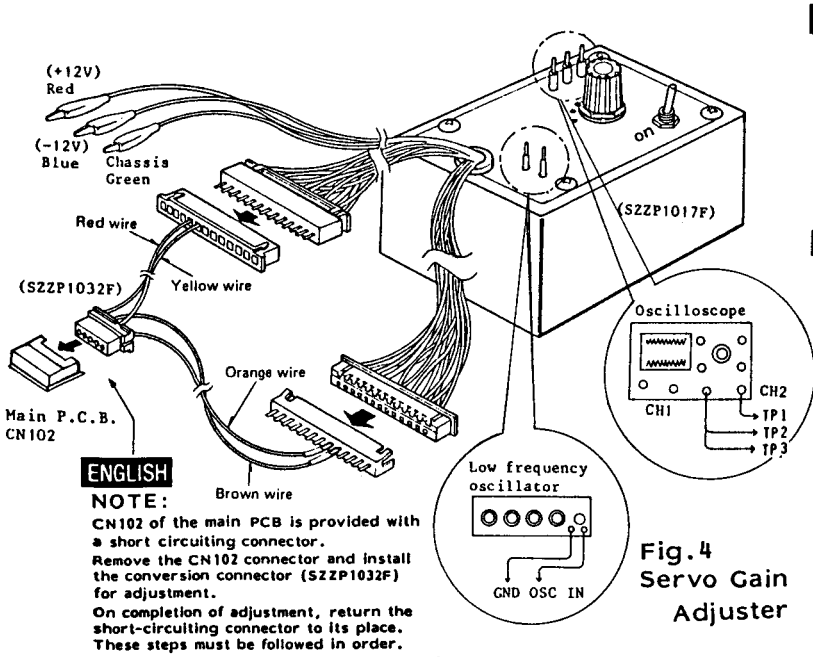


Fig.4 Servo Gain Adjuster

ENGLISH

NOTE:

CN102 of the main PCB is provided with a short circuiting connector.
Remove the CN102 connector and install the conversion connector (SZZP1032F) for adjustment.
On completion of adjustment, return the short-circuiting connector to its place.
These steps must be followed in order.

Caution: Do not look into the lens when power is applied to the unit, since there is laser radiation (H.H.S./D.H.W./etc., regulation).

DEUTSCH **HINWEIS:**

CN 102 der Haupt-Schaltplatte ist mit einem Kurzschlußschaltstück versehen.
Den CN 105-Steckkontakt abnehmen und während der Einstellung den Konverter-stecker (SZZP1032F) anbringen.
Diese Schritte müssen in der beschriebenen Reihenfolge durchgeführt werden.
Vorsicht: Bei eingeschaltetem Gerät nicht in die Linse schauen, da Laserstrahlen abgegeben werden (Vorschriften H.H.S/D.H.W/usw.)

FRANÇAIS **NOTA:**

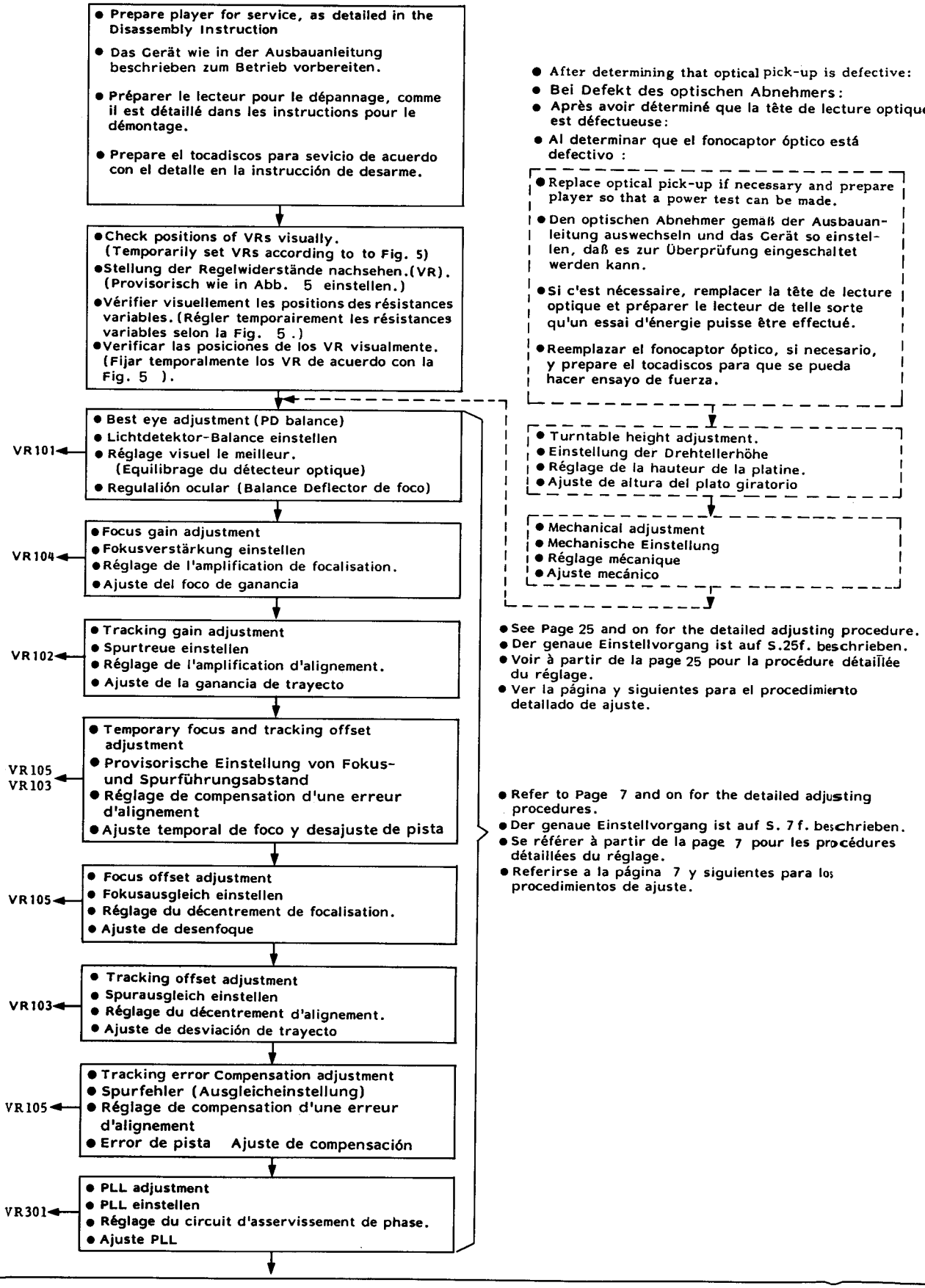
CN102 de la plaquette à circuits imprimés principale est muni d'un connecteur de court-circuitage.
Retirer le connecteur CN 105 et installer le connecteur de conversion (SZZP1032F) pour le réglage.
Une fois achevé le réglage, remettre le connecteur de court-circuitage à son emplacement.
Ces étapes doivent être suivies dans l'ordre.
Avertissement: Ne pas regarder dans la lentille lorsque l'énergie est appliquée à l'appareil, étant donné qu'il y a un rayonnement de laser (directives H.H.S./D. H.W/etc.,).

ESPAÑOL **NOTA:**

El CN102 de la tablilla de circuitos impresos, está provisto de
Quitar el conector CN105 e instalar el conector de conversión (SZZP1032F) para el ajuste.
Al terminar el ajuste, se devuelve el conector de cortocircuito a su lugar. Estos pasos debe seguirse en orden.

Cuidado: No semire adentro del leite cuando la fuerza se aplique al grupo, por lo que se encuentra radiación de laser. (H.H.S./D.H.W./etc., regulación).

3. ELECTRON ADJUSTMENT STEPS
3. SCHRITTE UND VORGÄNGE BEI DER ELEKTRONISCHEN EINSTELLUNG
3. ÉTAPES POUR LE RÉGLAGE ÉLECTRONIQUE
3. PASOS Y PUNTOS DEL AJUSTEELECTRÓNICO


● Prepare player for service, as detailed in the Disassembly Instruction
● Das Gerät wie in der Ausbauanleitung beschrieben zum Betrieb vorbereiten.
● Préparer le lecteur pour le dépannage, comme il est détaillé dans les instructions pour le démontage.
● Prepare el tocadiscos para sevicio de acuerdo con el detalle en la instrucción de desarme.
● Check positions of VRs visually. (Temporarily set VRs according to to Fig. 5)
●Stellung der Regelwiderstände nachsehen.(VR). (Provisorisch wie in Abb. 5 einstellen.)
●Vérifier visuellement les positions des résistances variables. (Régler temporairement les résistances variables selon la Fig. 5.)
●Verificar las posiciones de los VR visualmente. (Fijar temporalmente los VR de acuerdo con la Fig. 5).
● Best eye adjustment (PD balance)
● Lichtdetektor-Balance einstellen
● Réglage visuel le meilleur. (Equilibrage du détecteur optique)
● Regulalión ocular (Balance Deflector de foco)
VR101
● Focus gain adjustment
● Fokusverstärkung einstellen
● Réglage de l'amplification de focalisation.
● Ajuste del foco de ganancia
VR104
● Tracking gain adjustment
● Spurtreue einstellen
● Réglage de l'amplification d'alignement.
● Ajuste de la ganancia de trayecto
VR102
● Temporary focus and tracking offset adjustment
● Provisorische Einstellung von Fokus- und Spurführungsabstand
● Réglage de compensation d'une erreur d'alignement
● Ajuste temporal de foco y desajuste de pista
VR105
VR103
● Focus offset adjustment
● Fokusausgleich einstellen
● Réglage du décentrement de focalisation.
● Ajuste de desenfoque
VR105
● Tracking offset adjustment
● Spurausgleich einstellen
● Réglage du décentrement d'alignement.
● Ajuste de desviación de trayecto
VR103
● Tracking error Compensation adjustment
● Spurfehler (Ausgleicheinstellung)
● Réglage de compensation d'une erreur d'alignement
● Error de pista Ajuste de compensación
VR105
● PLL adjustment
● PLL einstellen
● Réglage du circuit d'asservissement de phase.
● Ajuste PLL
VR301
● After determining that optical pick-up is defective:
● Bei Defekt des optischen Abnehmers:
● Après avoir déterminé que la tête de lecture optique est défectueuse:
● Al determinar que el fonocaptor óptico está defectivo :
● Replace optical pick-up if necessary and prepare player so that a power test can be made.
● Den optischen Abnehmer gemäß der Ausbauanleitung auswechseln und das Gerät so einstellen, daß es zur Überprüfung eingeschaltet werden kann.
● Si c'est nécessaire, remplacer la tête de lecture optique et préparer le lecteur de telle sorte qu'un essai d'énergie puisse être effectué.
● Reemplazar el fonocaptor óptico, si necesario, y prepare el tocadiscos para que se pueda hacer ensayo de fuerza.
● Turntable height adjustment.
● Einstellung der Drehtellerhöhe
● Réglage de la hauteur de la platine.
● Ajuste de altura del plato giratorio
● Mechanical adjustment
● Mechanische Einstellung
● Réglage mécanique
● Ajuste mecánico
● See Page 25 and on for the detailed adjusting procedure.
● Der genaue Einstellvorgang ist auf S.25f. beschrieben.
● Voir à partir de la page 25 pour la procédure détaillée du réglage.
● Ver la página y siguientes para el procedimiento detallado de ajuste.
● Refer to Page 7 and on for the detailed adjusting procedures.
● Der genaue Einstellvorgang ist auf S. 7 f. beschrieben.
● Se référer à partir de la page 7 pour les procédures détaillées du réglage.
● Referirse a la página 7 y siguientes para los procedimientos de ajuste.

ORDER NO. HAD8610746S0
A6

Service Manual

Supplement

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-P310

SL-P310

Please use this manual together with the service manual for Model No. SL-P310, Order No. HAD8607667C0.

Notes:

★ The main P.C.B. of this unit was changed at the production. Be careful about this point during servicing.
(Main changes)
1. Mounting the muting relay circuit into main P.C.B.
2. Discontinuing of parts mounted on the foil side of P.C.B.

★ This supplement should be filed with the service manual for Model No. SL-P310, Order No. HAD8607667C0.

CHANGES

■ REPLACEMENT PARTS LIST

Ref. No.	Change of Part No. OLD → NEW		Part Name & Descrption	Per Set (Pcs.)	Remarks
INTEGRATED CIRCUITS					
IC806	– – – – –	MN1280–S	IC, Reset Signal Generator	1	Addition
IC1001	MN1280–S	– – – – –	IC, Reset Signal Generator	0	Deletion
TRANSISTORS					
Q801	– – – – –	UN4212	Transistor, Switching	1	Addition
Q802	– – – – –	UN4113	Transistor, Switching	1	Addtion
Q803	– – – – –	2SC3311–Q	Transistor, Relay Drive	1	Addition
Q1001	UN4212	– – – – –	Transistor, Switching	0	Deletion
Q1002	UN4112	– – – – –	Transistor, Relay Drive	0	Deletion
DIODES					
D801	– – – – –	MA165	Diode	1	Addtion
D1001 ~1004	MA165	– – – – –	Diode	0	Deletion
RELAYS					
RL801	SSYD2	– – – – –	Relay, Muting	1	Addtion
RL1001	– – – – –	SFDYG5A237P	Relay, Muting	0	Deletion
RESISTORS					
R819	ERDS2TJ102	– – – – –	Carbon, 1/4W, 1kΩ, ±5%	1	Addtion
R820	ERDS2TJ102	– – – – –	Carbon, 1/4W, 1kΩ, ±5%	1	Addtion
R821	ERDS2TJ103	– – – – –	Carbon, 1/4W, 10kΩ, ±5%	1	Addtion
R1001	– – – – –	ERDS2TJ103	Carbon, 1/4W, 10kΩ, ±5%	0	Deletion
CAPACITOR					
C817	ECFD1H104ZF	– – – – –	Semiconductor, 50V, 0.1μF, $\pm^{80}_{20}$%	1	Addition

Technics

Matsushita Services Company
50 Meadowland Parkway,
Secaucus, New Jersey 07094

Panasonic Sales Company,
Division of Matsushita Electric
of Puerto Rico, Inc.
Ave. 65 De Infanteria, KM 9.7
Victoria Industrial Park
Carolina, Puerto Rico 00630

Panasonic Hawaii Inc.
91-238 Kauhi St. Ewa Beach
P.O. Box 774
Honolulu, Hawaii 96808-0774

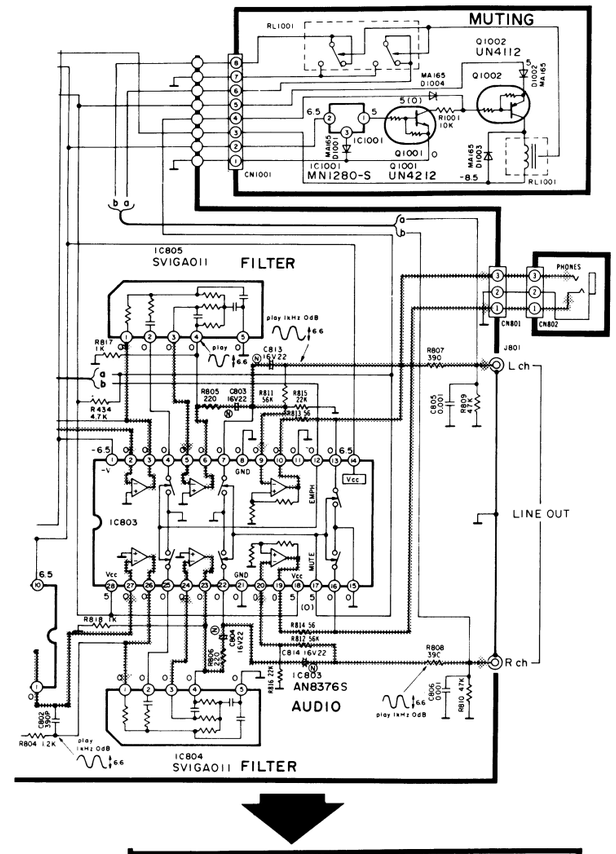
Matsushita Electric
of Canada Limited
5770 Ambler Drive, Mississauga,
Ontario, L4W 2T3

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

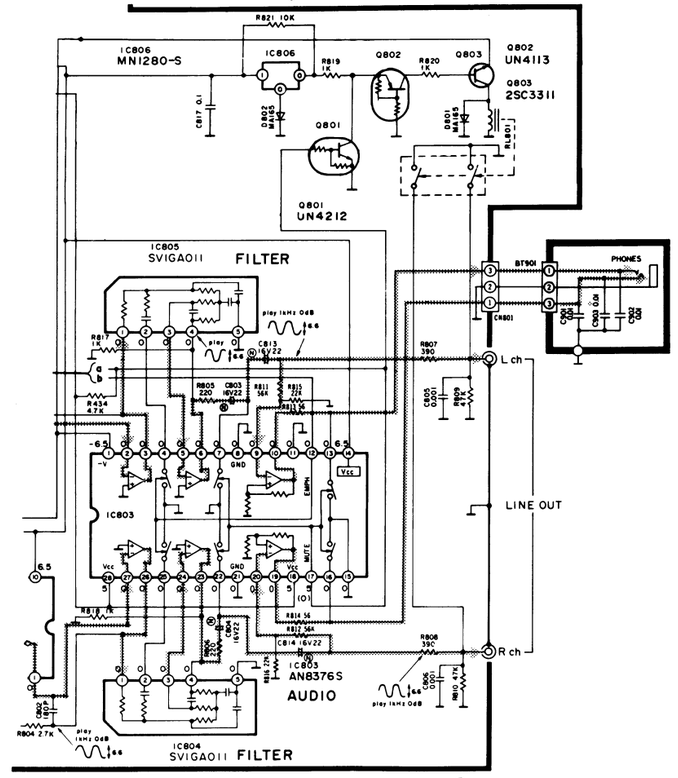
Panasonic Tokyo Office
Matsushita Electric Trading Co., Ltd.
6th Floor, World Trade Center Bldg.,
No. 4-1, Hamamatsu-cho 2-Chome, Minato-ku,
Tokyo 105, Japan

■ SCHEMATIC DIAGRAM

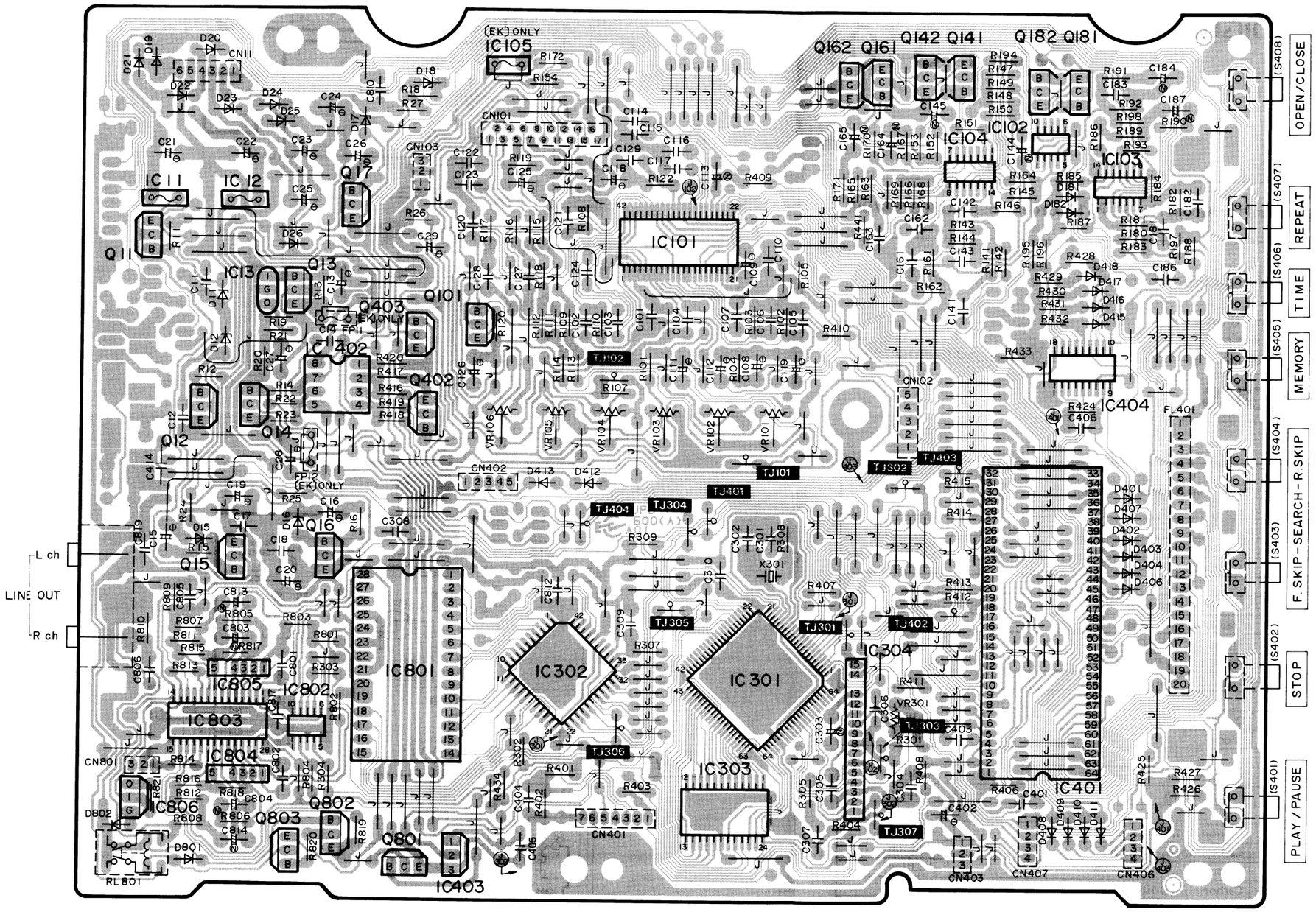
OLD



NEW



■ PRINTED CIRCUIT BOARD



Printed in Japan
861010000 Ⓚ AM

- Check of playback on completion of adjustment
- Nach der Einstellung Wiedergabe überprüfen
- Vérification de la lecture à l'achèvement du réglage.
- Verificación de la audición después de completar el ajuste

- Refer to the operation manual or the service manual for the detailed operating procedure etc.
- Der genaue Vorgang ist in der Betriebsanleitung und in der Reparaturanleitung beschrieben.
- Se référer au manuel de fonctionnement ou au manuel de dépannage/entretien pour la procédure détaillée du fonctionnement, etc.
- Referirse al manual de operación o al de servicio para el proceso detallado de la operación etc.

- Check of skip search
- Überprüfung der automatischen Liedanfang-Suche
- Vérification de la recherche par saut.
- Vérificación de salida de rastreo

- Check of manual search
- Überprüfung der manuellen Liedanfang-Suche
- Vérification de la recherche manuelle.
- Vérificación de rastreo manual

- Confirmation of defect
- Feststellung des Defekts
- Vérification d'un défaut.
- Confirmación del defecto

- By setting the VR's temporarily as shown in Fig. 5 the player with its optical pick-up may appear to be normal but VR's must still be adjusted properly.
- Wenn die Regelwiderstände provisorisch wie in Abb. 5 eingestellt sind, arbeitet das Gerät zufriedenstellend; abschließend muß die Einstellung jedoch optimal sein.

- En réglant temporairement les résistances variables comme il est montré à la Fig. 5, l'appareil avec sa tête de lecture optique pourra sembler être en condition normale, mais les résistances variables devront encore être réglées correctement.
- Fijando temporalmente los VR como se muestra en la Fig. 5 , el tocadiscos se mueve de manera que el captador actúa satisfactoriamente, pero los VR se han de ajustar al final con exactitud.

4. INITIAL SETTING OF VARIABLE RESISTORS (VR)
4. VORLÄUFIGE EINSTELLNG DER REGELWIDERSTÄNDE (VR)
4. RÉGLAGE INITIAL DES RÉSISTANCES VARIABLES (VR)
4. FIJACION INICIAL DE LAS RESISTENCIAS VARIABLES DE AJUSTE (VR)

ENGLISH

- Adjusting Variable Resistors and Test Points

The player operates, but not at its best with the initial setting of the variable resistors. Adjust them according to the proper procedure.

Perform the electronic adjustment when any electric part is replaced. Perform ① optical pick-up adjustment and ② electronic adjustment in the stated order, when the optical pick-up (SOAD30A) is replaced.

For adjusting the variable resistors, view the drawing to the right of the above Fig. 5.
All the electronic adjustments are possible by adjusting as shown in Fig. 5.
(Remove the power supply switch rod for the convenience of adjustment.)

DEUTSCH

- Einstellung der Regelwiderstände und der Prüfkontakte

Bei der oben dargestellten Stellung der Regelwiderstände funktioniert das Gerät, aber nicht optimal. Gemäß dem Einstellvorgang einstellen.

Die elektrische Einstellung muß immer durchgeführt werden, wenn ein elektrisches Teil ausgewechselt wird. Bei Auswechseln des optischen Abnehmers immer ① die Einstellung des optischen Abnehmers und ② elektrische Einstellung in dieser Reihenfolge durchführen. (Optischer Abnehmer = SO AD 30A)

Die Regelwiderstände an der Seitenfläche können alle wie in Abb. 5 eingestellt werden. (Um die Arbeit bei der Einstellung zu erleichtern, kann der Schaltstab des Netzschalters abgenommen werden.)

FRANÇAIS

- Réglage des résistances variables et des points de mesure

L'appareil fonctionne, mais non dans les conditions optima du réglage initial des résistances variables. Les régler selon la procédure appropriée.

Réaliser un réglage électronique lorsque n'importe quel élément électrique est remplacé. Effecturer ① le réglage de la tête de lecture optique et ② le réglage électronique dans l'ordre indiqué, lorsque la tête de lecture optique (SOAD30A) est remplacée.

Pour le réglage des résistances variables, voir le schéma à la droite de la Fig. 5 ci-dessus.
L'ensemble des mises au point électroniques est possible en réglant comme il est montré à la Fig. 5.
(Retirer la tige d'attaque de l'interrupteur d'alimentation pour la commodité de l'ajustement.)

ESPAÑOL

- inicial de las resistencias variables.

Se tien que hacer un ajuste electrónico cuando se cambia cualquier pieza eléctrica. Hacer ①primero el ajuste del colector óptico y luego②el ajuste electrónico en el orden debidos cuando se cambie el colector óptico (SOAD30A)

los ajustes
electrónicos haciendo la fijación tal como indica la Fig. 5.

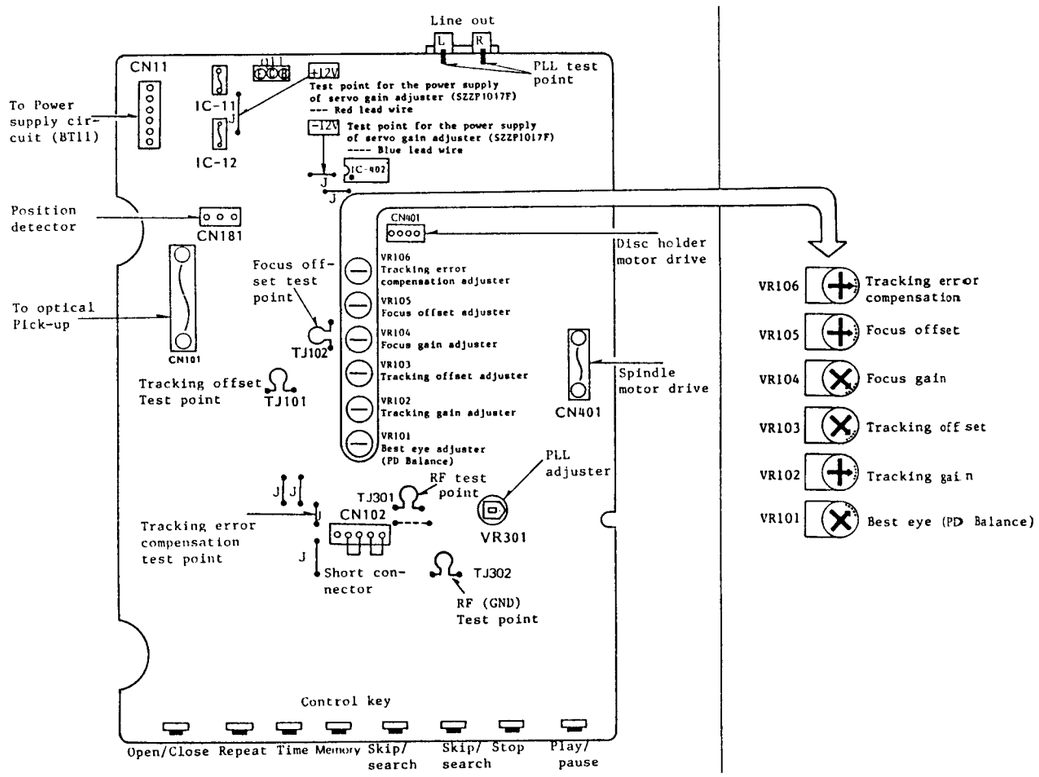


Fig. 5 Main circuit

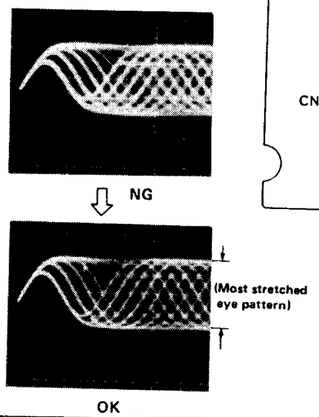
5. ELECTRONIC ADJUSTMENT PROCEDURE
5. EINSTELLVORGANG FÜR ELEKTRONIK
5. PROCÉDURE POUR LE RÉGLAGE ELECTRONIQUE
5. PROCEDIMIENTO DEL AJUSTE ELECTRONICO

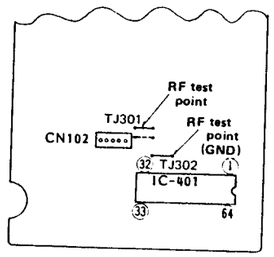
ENGLISH — A. Best Eye (PD Balance) Adjustment

(1) Connect CH-1 of the oscilloscope to the **RF test point** (TJ301) and the grounding test Point (TJ302) on the main PCB as shown in the illustration.

Oscilloscope setting ---
- Volt : 500 mV
- Sweep : 0.5 µsec
- Input : AC

(2) Turn on the power supply switch of the player.
(3) Place the test disc **(SZZP1014F)** or **(SZZP1054C)** into the disc holder by open/close button.
(4) The player to the play mode.
(5) Play of the test disc. (BS 0.5mm)
SZZP1014F (Old) ----- Track 13
(New) ----- Track 8
SZZP1054C ---------- Track 11
(6) Adjust **VR101** so that the eye pattern of RF signal is stretched to maximum as shown in the illustration.
(7) Turn off the power supply switch of the player.





Main PCB

Fig. 6 Best eye

DEUTSCH — A. Einstellung der Lichtdetektor-Balance (Best Eye)

(1) CH-1 des Oszilloskops an den RF-Meßpunkt (TJ301) und an den Erdungsmeßpunkt (TJ302) der Haupt-Schaltplatte wie in der Abbildung gezeigt anschließen.

Einstellung des Oszilloskops ---
- Spannung : 500 mV
- Ablenkung : 0,5 µs
- Eingang : Wechselstrom

(2) Die Stromversorgung des Geräts einschalten.
(3) Testdisk SZZP1014F oder SZZP1054C durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.
(4) Das Gerät auf Wiedergabe stellen.
(5) Testdisk abspielen (BS 0,5mm)
SZZP1014F (alt) -------- Spur 13
(neu)-------- Spur 8
SZZP1054C ------------ Spur 11
(6) VR 101 so einstellen, daß das RF-Signal so gedehnt wie möglich (s. Abbildung) erscheint.
(7) Die Stromzufuhr zum Gerät abschalten.

FRANÇAIS — A. Réglage visuel le meilleur (Equilibrage du détecteur optique)

(1) Raccorder le canal 1 de l'oscilloscope au point de mesure haute fréquence (TJ301) et au point de mesure de mise à la terre (TJ302) sur la plaquette à circuits imprimés principale, comme il est montré sur l'illustration.

Réglages de l'oscilloscope
- Tension ..... 500 mV
- Balayage ..... 0,5 µsec.
- Sélecteur d'entrée ... C.A.

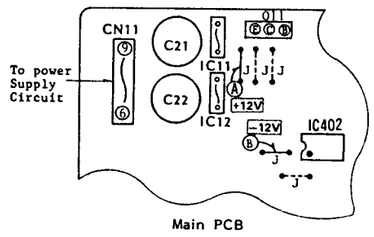
(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Installer le disque d'essai (SZZP1014F) ou (SZZP1054C) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer le disque d'essai. (Zone d'interférence de 0,5 mm)
SZZP1014F (Ancien) ----- Piste 13
(Nouveau) ---- Piste 8
SZZP1054C ------------ Piste 11
(6) Régler VR101 de telle sorte que l'oscillogramme visuel du signal de haute fréquence soit étiré au maximum, comme il est montré sur l'illustration.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

ESPAÑOL — A. Ajuste ocular mejor (Balance del detector óptico)

(1) Conectar el Canal-1 del osciloscopio al punto RF de prueba (TJ301) y el punto de prueba de masa (TJ302) de la tablilla de circuítos impresos como muestra la figura.

Fijación del osciloscopio ---
- Voltaje : 500mV
- Barrido : 0,5 µseg
- Potencia de entrada : CA

(2) Encender el interruptor de la fuente de energía del tocadiscos.
(3) Poner el disco de prueba (SZZP1014F) o (SZZP1054C) en el soporte del disco por medio del botón de abrir y cerrar.
(4) El todadiscos en el modo de audición.
(5) Hacer funcionar el disco de prueba. (BS 0,5mm)
SZZP1014 (antiguo) ----- Pista 13
(nuevo)------- Pista 8
SZZP1054C---------- Pista 11
(6) Ajustar la VR101 de manera que el módulo visual de la señal RF sea extensa al máximo, como muestra la figura.
(7) Apagar el interruptor de fuente de energía del tocadiscos.



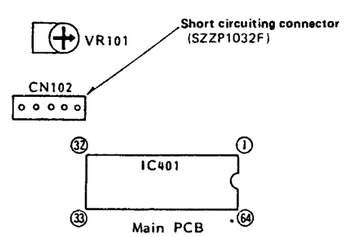
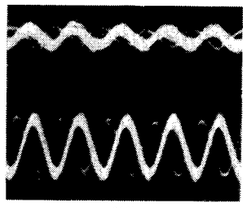
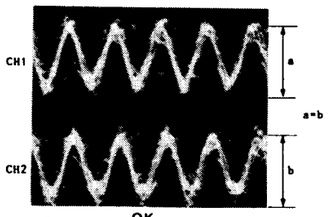


Fig. 7


NG



OK

Fig. 9 Focus gain

Initial setting mode of servo gain adjuster

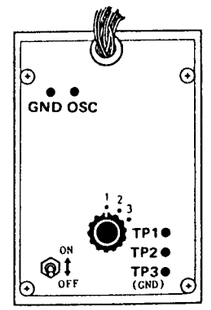


Fig. 8

Servo Gain Adjuster (SZZP1017F)

(1) mode select switch to "2" position.
(2) ON/OFF switch to "ON" position.

B. Focus Gain Adjustment

(1) Connect the servo gain adjuster **(SZZP1017F)** with conversion connector **(SZZP1032F)** to the player as shown in the illustration.

Connecting points
- **Red lead wire** -----Ⓐ Jumper +12V near Q11 terminals on the main PCB.
- **Blue lead wire** -----Ⓑ Jumper -12V near IC402 on the main PCB.
- **Green read wire** ---Chassis
- **Connector**-------- Remove the short-circuiting plug **CN102** on the Main PCB and connect the conversion connector (SZZP1032F).

(2) Set the low frequency oscillator to a frequency **750 Hz** and an output voltage of **150m Vp-p.** Then connect the oscillator to the terminals OSC IN and GND of the servo gain adjuster **(SZZP1017F).**
(3) Connect CH-1 and CH-2 of the oscilloscope to **TP1** and **TP2** of the Servo gain adjuster **(SZZP1017F).** (TP3 is the grounding terminal.)

Oscilloscope setting --
- Volt ..... 100 mV
- Sweep ..... 1 ms
- Input selector..... DC

(4) Turn on the power supply switch of the player.
(5) Place the test disc **(SZZP1014F)** or **(SZZP1054C)** in to the disc holder by open/close button and in the Playback mode.
(6) Set the rotary switch of the servo gain adjuster **(SZZP1017F)** to **"2" → "1".**

(7) The player to the Play mode, the 750 Hz signal will be displayed on the oscilloscope. Then adjust VR104 so that the waveforms and amplitudes of both channels shall be equal as shown in the illustration.
(8) Turn off the power supply switch of the player.

(Note) Please Do not remove the servo gain adjuster also shorting connector.

B. Einstellung der Fokusverstärkung

(1) Den Servo-Verstärkungsregler (SZZP1017F) mit Hilfe des Konverter-Steckkontakts (SZZP1032F) wie in der Abbildung gezeigt an das Gerät anschließen.

Anschlußpunkte:
- Roter Draht ---- Brücke A +12V neben den Q11-Kontakten auf der Haupt-Schaltplatte
- Blauer Draht --- Brücke B -12V neben dem IC402-Kontakt auf der Haupt-Schaltplatte
- Grüner Draht--- Chassis
- Stecker -------- Kurzschlußkontakt von CN102 auf der Haupt-Schaltplatte entfernen und den Konverter-Steckkontakt (SZZP1032F) anschließen. Den Steckkontakt mit der Konverterseite (5 Nadeln) an CN 102 anschließen.

(2) Auf dem Niederfrequenz-Oszillator eine Frequenz von 750 Hz und Ausgangsspannung von 150mVp-p einstellen, dann den Oszillator an die Klemmen OSC IN und GND des Servo-Verstärkungsreglers anschließen (SZZP1017F).
(3) CH-1 und CH-2 des Oszilloskops an TP1 und TP2 des Servoverstärkungsreglers (SZZP1017F) anbringen. (TP3 ist die Erdungsklemme.)

Einstellung des Oszilloskops:
- Spannung ..... 100 mV
- Ablenkung ..... 1 ms
- Eingangsumschalter ..... Gleichstrom

(4) Die Stromversorgung des Geräts einschalten.
(5) Testdisk SZZP1014F oder SZZP1054C durch Betätigung der Auf/Zu-Taste in das Gerät einlegen und auf Wiedergabe-Betrieb schalten.
(6) Den Schaltknopf für den Servo-Verstärkungsregler (SZZP1017F) von "2" auf "1" stellen.
(7) Wenn das Gerät auf Wiedergabe geschaltet ist und das 750Hz-Signal auf dem Oszilloskop erscheint, muß VR104 so eingestellt werden, daß die Signalformen und Amplitüden beider Kanäle gleich sind (s. Abb.).
(8) Die Stromversorgung des Geräts abschalten.

(Hinweis) Kurzschlußstecker und Stecker des Servo-Verstärkungsreglers bitte nicht abnehmen.

B. Réglage de l'amplification de focalisation

(1) Raccorder l'ajusteur de l'amplification asservie (SZZP1017F) avec le connecteur de conversion (SZZP1032F) au lecteur, comme il est montré sur l'illustration.

Points de raccordement:
- Fil de jonction rouge ---- Ⓐ Jarretière +12V près des bornes Q11 sur la plaquette à circuits imprimés principale.
- Fil de jonction bleu ---- Ⓑ Jarretière -12V près de IC402 sur la plaquette à circuits imprimés principale.
- Fil de jonction vert ---- Châssis
- Connecteur----- Retirer la fiche de court-circuitage de CN102 sur la plaquette à circuits imprimés principale et raccorder le connecteur de conversion (SZZP1032F).

(2) Régler l'oscillateur à basses fréquences sur une fréquence de 750 Hz et une tension de sortie de 150 mV crête-à-crête. Puis, brancher l'oscillateur aux bornes OSC IN (entrée d'oscillateur) et GND (terre) de l'ajusteur d'amplification asservie (SZZP1017F).
(3) Raccorder le canal 1 et le canal 2 de l'oscilloscope à TP1 et TP2 de l'ajusteur d'amplification asservie (SZZP1017F). (TP3 est la borne de mise à la terre.)

Réglages de l'oscilloscope:
- Tension ..... 100 mV
- Balayage ..... 1 ms
- Sélecteur d'entrée ... C.C.

(4) Mettre en marche l'interrupteur d'alimentation du lecteur.
(5) Installer le disque d'essai (SZZP1014F) ou (SZZP1054C) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture et en réglant sur le mode de lecture.
(6) Régler le commutateur rotatif de l'ajusteur d'amplification asservie (SZZP1017F) sur "2" →"1".
(7) Le lecteur étant sur le mode de lecture, un signal de 750 Hz sera affiché sur l'oscilloscope. Puis, régler VR104 de telle sorte que les formes d'ondes et les amplitudes des deux canaux soient égales, comme il est montré sur l'illustration.
(8) Mettre hors circuit l'interrupteur d'alimentation en courant du lecteur.

(Nota) Veuillez ne pas retirer l'ajusteur de l'amplification asservie ainsi que le connecteur de court-circuitage.

B. Ajuste de ganancia de foco

(1) Conectar el ajustador de ganancia de servo (SZZP1017F) con el conector de conversión (SZZP1032F) al tocadiscos como muestra la figura.
- Hilo conductor rojo ------ (A) Puente +12V junto a los terminales Q11 en la tablilla de circuítos imprsos principal.
- Hilo conductor azul ----- (B) Puento -12V cerca del terminal IC402 en la tablilla de circuítos impresos principal.
- Hilo conductor verde -- Masa (chasis)
- Conector ------- Quitar el borne de cortocircuíto de CN102 en la tablilla principal de CN102 en la tablilla principal de circuitos impresos y empalmar el conector de conversión (SZZP1032F).

(2) Fijar el oscilador de baja frecuencia a una frecuencia de 750 Hz y un voltaje de potencia de salida de 150 mV_{p-p} y luego conectar el oscilador a los terminales OSC IN y TIERRA del ajustador de ganancia de servo (SZZP1017F).
(3) Conectar el CANAL-1 y el CANAL-2 al osciloscopio al TP1 y TP2 del ajustador de ganancia de servo (SZZP1017F).

Fijación del osciloscopio --
- Voltaje ..... 100 mV
- Barrido ..... 1 ms
- Selector de potencia de enrada ..... CD

(4) Encender el interruptor de la fuente de energía del tocadiscos.
(5) Colocar el disco de prueba (SZZP1014F) o (SZZP1054C) en el soporte del cisco por medio del botón de abrir/cerrar en el modo de audioreproducción.
(6) Fijar el interruptor rotativo del ajustador de ganacia de servo (SZZP1017F) en "2" → "1".
(7) Con el tocadiscos en el modo de audioreproducción en el osciloscopio se verá la señal de 750Hz, ajustándose luego VR104 de manera que las formas de onda y las amplitudes de ambos canales sean iguales como se muestra en la figura.
(8) Apagar el interruptor de la fuente de anergía del tocadiscos.

(Nota) No quitar el ajustador de ganacia de servo ni el conector de cortocircuíto.

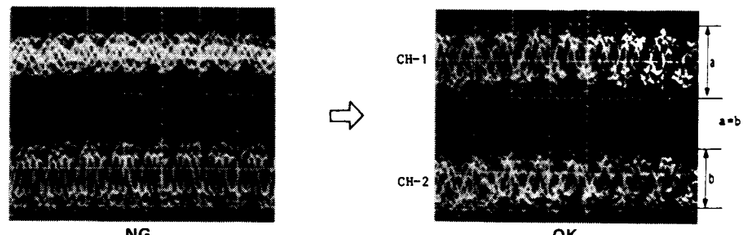


Fig. 10 Tracking gain

C. Tracking Gain Adjustment

(1) Set the low frequency oscillator to 1.0 kHz and an output of 150 mVp–p, and connect the oscillator to the OSC IN and GND of the gain adjuster (SZZP1017F).
(2) Connect the CH-1 and CH-2 of the oscilloscope to the TP1 and TP2 of the gain adjuster (SZZP1017F). (TP3 is a grounding terminal.)

Oscilloscope setting ---
- Volt : 100mV
- Sweep : 1.0ms
- Input selector : DC

(3) Turn on the power supply switch of the Player.
(4) Place the test disc (SZZP1014F) or (SZZP1054C) into the disc holder by open/close button and in the Playback mode.
(5) Set the rotary switch of the servo gain adjuster (SZZP1017F) to "2" → "3".
(6) With the player to the play mode, the 1.0 kHz signal will be displayed on the oscilloscope, then adjust VR102 so that the waveforms and amplitudes of both channels shall be equal as shown in the illustration.
(7) Turn off the power supply switch of the player.
(8) After completing the above mentioned adjustment, remove the servo gain adjuster and insert the shorting connector into CN102.

C. Einstellung der Spurtreue

(1) Den Niederfrequenz-Oszillator auf eine Frequenz von **1.0kHz** und einen Ausgangswert von 150mVp-p einstellen und an OSC IN und GND des Verstärkungsreglers (SZZP1017F) anschließen.
(2) CH-1 und CH-2 des Oszilloskops an die Klemmen TP1 und TP2 des Verstärkungsreglers (SZZP1017F) anschließen. (TP3 ist eine Erdungsklemme).

Einstellung des Oszilloskops:
- Spannung 100mV
- Ablenkung **1.0ms**
- Eingangsumschalter ..... Gleichstrom

(3) Die Stromversorgung des Geräts einschalten.
(4) Testdisk SZZP1014F oder SZZP1054C durch Betätigung der Auf/Zu-Taste in das Gerät einlegen und auf Wiedergabe-Betrieb schalten.
(5) Den Schaltknopf für den Servo-Verstärkungsregler (SZZP1017F) von "2" auf "3" stellen.
(6) Wenn das Gerät auf Wiedergabe geschaltet ist und das 1,0kHz-Signal auf dem Oszilloskop erscheint, muß VR 102 so eingestellt werden, daß die Signalformen und Amplitüden beider Kanäle gleich sind (s.Abb.)
(7) Die Stromzufuhr zum Gerät abschalten.
(8) Nach beendigter Einstellung den Servo-Verstärkungsregler entfernen und das Kurzschlußschaltstück wie zu Anfang an CN102 anbringen.

C. Réglage de l'amplification d'alignement

(1) Régler l'oscillateur de basses fréquences sur 1,0 kHz et une sortie de 150 mV crête-à-crête, puis brancher l'oscillateur aux bornes OSC IN (entrée d'oscillateur) et GND (terre) de l'ajusteur d'amplification asservie (SZZP1017F).
(2) Raccorder le canal 1 et le canal 2 de l'oscilloscope à TP1 et TP2 de l'ajusteur d'amplification asservie (SZZP1017F). (TP3 est la borne de mise à la terre.)

Réglages de l'oscilloscope :
- Tension ..... 100 mV
- Balayage 1.0ms
- Sélecteur d'entrée ... C.C.

(3) Mettre en marche l'interrupteur d'alimentation du lecteur.
(4) Installer le disque d'essai (SZZP1014F) ou (SZZP1054C) dans le dispositif du support pour disque en utilisant la touche d'ouverture/fermeture et en réglant sur le mode de lecture.
(5) Régler le commutateur rotatif de l'ajusteur d'amplification asservie (SZZP1017F) sur "2" → "3".
(6) Avec la lecteur sur le mode de lecture, un signal de 1,0 kHz sera affiché sur l'oscilloscope; puis, régler VR102 de telle sorte que les formes d'ondes et les amplitudes des deux canaux soient égales, comme il est montré sur l'illustration.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.
(8) Après l'achèvement du réglage mentionné ci-dessus, retirer l'ajusteur d'amplification asservie et insérer le connecteur de court-circuitage dans CN102.

C. Ajuste de gancia de trayectoria

(1) Ajustar el oscilador de baja frecuencia a la frecuencia de 1.0 kHz y una potencia de salida de 150mVp-p, y conectar el oscilador a OSC IN y TIERRA del ajustador de ganancia (SZZP1017F).
(2) Conectar el CANAL-1 y el CANAL-2 del osciloscopio a TP1 y TP2 del ajustador de ganancia (SZZP1017F). (TP3 es un terminal de tierra.)

Fijación del osciloscopio:
- Voltaje ..... 100 mV
- Barrido ..... 1.0 ms
- Selector de potencia de entrada ..... CD

(3) Encender el interruptor de fuente de energía del tocadiscos.
(4) Colocar el disco de prueba (SZZP1014F) o (SZZP1054C) en el soporte del disco por medio de la tecla de abrir/cerrar y en el modo de audioreproducción.
(5) Fijar el interruptor rotativo del ajustador de ganancia de servo (SZZP1017F) en "2" → "1".
(6) Con el todaciscos en el modo de audioreproducción se verá en el osciloscopio la señal de 1,0kHz, ajustando luego VR102 de manera que las formas de onda y las amplitudes de ambos canales sean iguales, como muestra la figura.
(7) Apagar el interruptor de fuente de energía del tocadiscos.
(8) Después de completar los referidos ajustes, quitar el ajustador de ganancia de servo e insertar el conectador de cortocircuíto en CN102.

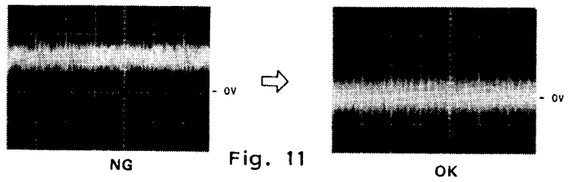


Fig. 11

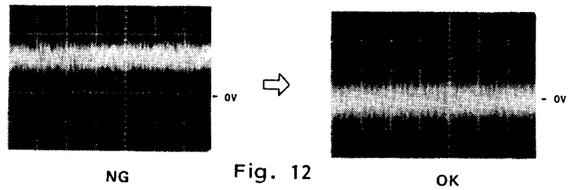
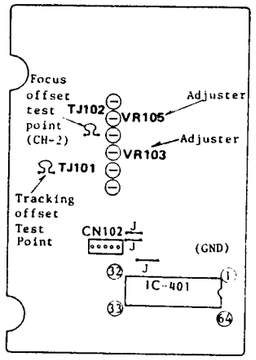


Fig. 12



Main PCB

D. Temporary focus and tracking offset adjustment

(Focus offset)
(1) Connect CH-1 of the oscilloscope to **TJ102** (Focus offset test point) and GND to the chassis.

Oscilloscope setting:
- Volt : 100mV
- Sweep : 5ms
- Input selector : DC

(2) Turn on the power supply switch of the player.
(3) Place the test disc **(SZZP1057C . . . Black band disc)** into the disc holder by open/close botton.
(4) After TOC reading, the set will enter the stop mode. Then check the waveform on the oscilloscope and adjust **VR105**, so that the waveform at TJ102 is at 0V (**Ground level**) as shown in the illustration.

(Tracking offset)
(1) Connect CH-1 of the oscilloscope to **TJ101** (tracking offset test point) and **GND** to the chassis.

Oscilloscope setting:
- Volt : 100mV
- Sweep : 5ms
- Input selector : DC

(2) Turn on the power supply switch of the Player.
(3) Place the test disc **(SZZP1057C . . . Black band disc)** in to the disc holder by open/close button.
(4) After TOC reading, the set will enter the stop mode. Then check the waveform on the oscilloscope and adjust VR103, so that the waveform at **TJ101** is at 0V (**Ground level**) as shown in the illustration.
(5) Turn off the power supply switch of the Player.

D. Provisorische Einstellung von Fokus- und Spurführungsabstand

(Fokusabstand)
(1) CH-1 des Oszilloskops an TJ102 (Fokusabstand-Meßpunkt) und GND (Erdung) an das Gehäuse anschließen.

Oszilloskopeinstellung:
- Spannung : 100mV
- Ablenkung : 5ms
- Eingangswahlschalter : Gleichstrom

(2) Stromzufuhr zum Gerät einschalten.
(3) Testdisk (SZZP1057C...Schwarzes Band) durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.
(4) Nach erfolgter Ablesung schaltet sich das Gerät ab; Signalform auf dem Oszilloskop überprüfen und VR 105 so einstellen, daß das Signal an TJ102 wie auf der Abbildung auf 0V (Grundlinie) liegt.

(Spurführungsabstand)
(1) CH-1 des Oszilloskops an TJ101 (Meßpunkt für den Spurführungsabstand) und GND (Erdung) an das Gehäuse anschließen.

Oszilloskopeinstellung:
- Spannung : 100mV
- Ablenkung : 5ms
- Eingangswahlschalter : Gleichstrom

(2) Stromzufuhr zum Gerät einschalten.
(3) Testdisk (SZZP1057C... Schwarzes Band) durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.
(4) Nach erfolgter Ablesung schaltet sich das Gerät ab; Signalform auf dem Oszilloskop überprüfen und VR 103 so einstellen, daß das Signal an TJ101 wie auf der Abbildung auf 0 V (Grundlinie) liegt.
(5) Die Stromzufuhr zum Gerät abschalten.

D. Réglage du décentrement de l'alignement et de la focalisation temporaire

(Décentrement de la focalisation)

(1) Raccorder le canal 1 de l'oscilloscope à TJ102 (point de mesure du décentrement de focalisation) et la mise à la terre au châssis.

Réglage de l'oscilloscope
- Tension : 100mV
- Balayage : 5ms
- Sélecteur d'entrée : C.C.

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.

(3) Installer le disque d'essai (SZZP1057C... Disque à plage noire) dans le dispositif du support pour disque en utilisant la touche d'ouverture/fermeture.

(4) Après lecture de TOC (vérification du décentrement d'alignement), l'appareil sera mis sur le mode d'arrêt. Puis, vérifier la forme d'onde sur l'oscilloscope et régler VR105, de telle sorte que la forme d'onde à TJ102 soit à 0V (niveau de la mise à la terre) comme il est montré sur l'illustration.

(Décentrement de l'alignement)

(1) Raccorder le canal 1 de l'oscilloscope à TJ101 (point de mesure du décentrement de l'alignement) et la mise à la terre au châssis.

Réglage de l'oscilloscope
- Tension : 100mV
- Balayage : 5ms
- Sélecteur d'emtrée : C.C.

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.

(3) Installer le disque d'essai (SZZP1057C... Disque à plage noire) dans le dispositif du support pour disque en utilisant la touche d'ouverture/fermeture.

(4) Après lecture de TOC (vérification du décentrement d'alignement), l'appareil sera mis sur le mode d'arrêt. Puis, vérifier la forme d'onde sur l'oscilloscope et régler VR103 de telle sorte que la forme d'onde à TJ101 soit à 0V (niveau de la mise à la terre) comme il est montré sur l'illustration.

(5) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

D. Ajuste temporal del foco y de descentramiento de pista

(Descentramiento de foco)

(1) Conectar el canal 1 del osciloscopio al TJ102 (Punto de prueba de descentramiento de foco) y TIERRA a la masa (chasis).

Fijación del osciloscopio
- Voltaje : 100mV
- Barrido : 5ms
- Selector de potencia de entrada : CD

(2) Conectar el interruptor de la fuente de energía del tocadiscos.

(3) Poner el disco de prueba (SZZP1057P) ... disco de la banda negra) en el soporte del disco con el botón de abrir/cerrar.

(4) Después de leer TOC, la fijación pasará al modo de paro, verificándose después la forma de onda en el osciloscopio y ajustando VR105 estando la forma de onda en TJ102 (en nivel de TIERRA) como muestra la figura.

(Descentramiento de pista)

(1) Conectar el canal 1 del osciloscopio al TJ101 (Punto de prueba de descentramiento de pista) y TIERRA a la masa.

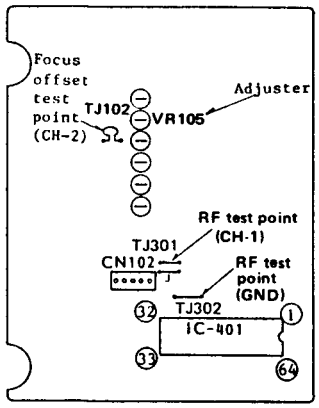
Fijación del osciloscopio
- Voltaje : 100mV
- Barrido : 5ms
- Selector de potencia de entrada : CD

(2) Conectar el interruptor de fuente de energía del tocadiscos.

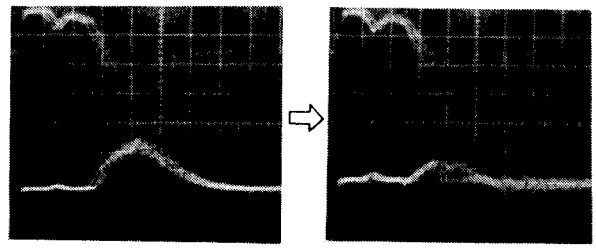
(3) Poner el disco de prueba (SZZP1057C... Disco de la banda negra) en el soporte del disco con el botón de abrir/cerrar.

(4) Después de leer TOC el juego se pondrá en el modo de paro, verificando luego la forma de onda en el osciloscopio y ajustando VR103 de manera que la forma de onda en TJ101 estando en 0V se pasará al modo de paro (en el nivel de TIERRA) como muestra la figura.

(5) Desconectar el interruptor de la fuente de energía del tocadiscos.



Main PCB



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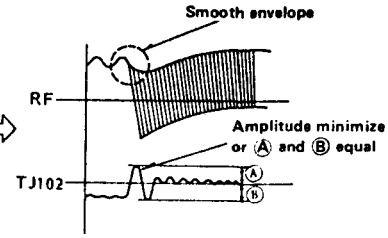


Fig. 13
Focus offset

E. Focus Offset Adjustment

(1) Connect CH-1 of the oscilloscope to the **TJ301** (RF test point) and CH-2 to the terminal **TJ102**. (Focus offset test point) on the main PCB. **TJ302** of RF test point (GND) on the main PCB as shown in illustration.

		TJ301(CH-1)	TJ102(CH-2)
Oscilloscope setting	Volt	: 500mV	100mV
	Sweep	: 0.5msec	
	Input Selector	: AC	DC
	Mode	: NORM(Triggering Via CH-1).	

(2) Turn on the power supply switch of the player.
(3) Place the test disc (**SZZP1057C . . . Black band disc**) into the disc holder by open/close button.
(4) The player to the play mode.
(5) Play **TR9** of the test disc.
(6) Check the waveforms of **CH-1** and **CH-2** on the oscilloscope and adjust **VR105** so that the waveform around the triggering point shall be as shown in the illustration.
(7) Turn off the power supply switch of the player.

E. Einstellung des Fokusausgleichs

(1) CH-1 des Oszilloskops an TJ301 (RF-Meßpunkt) und CH-2 an die Klemme TJ102 anschließen (Meßpunkt für Fokusabstand auf der Haupt-Schaltplatte). TJ302 des RF-Meßpunkts (GND) auf der Haupt-Schaltplatte ist wie auf der Abbildung.

		TJ301(CH-1)	TJ102 (CH-2)
Einstellung des Oszilloskops	Spannung	: 500mV	100mV
	Ablenkung	: 0.5 msec.	
	Eingangsumschalter	: Wechselstrom	Gleichstrom
	Betriebsart	: NORM (Auslösung über CH-1)	

(2) Die Stromversorgung des Geräts einschalten.
(3) Testdisk (SZZP1057C...Schwarzes Band) durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.
(4) Das Gerät auf Wiedergabe stellen.
(5) TR (Spur) 9 auf dem Testdisk abspielen.
(6) Signalformen von CH-1 und CH-2 auf dem Oszilloskop überprüfen und VR 105 so einstellen, daß die Signalform um den Auslösepunkt wie auf der Abbildung aussieht.
(7) Die Stromzufuhr zum Gerät abschalten.

E. Réglage du décentrement de focalisation

(1) Raccorder le canal 1 de l'oscilloscope à TJ301 (point de mesure à haute fréquence) et le canal 2 à la borne TJ102 (point de mesure du décentrement de la focalisation) sur la plaquette à circuits imprimés principale.
TJ302 du point de mesure à haute fréquence (terre) sur la plaquette à circuits imprimés principale est tel quil est montré sur l'illustration.

		TJ301 (Canal 1)	TJ102 (Canal 2)
Réglages de l'oscilloscope	Tension	: 500 mV	100 mV
	Balayage	: 0,5msec.	
	Sélecteur d'entrée	: C.A.	C.C.
	Mode	: NORM (Déclenchement via le canal 1)	

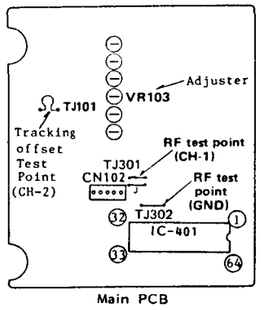
(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Installer le disque d'essaic (SZZP1057C..Disque à plage noire) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer la piste 9 du disque d'essai.
(6) Vérifier les formes d'ondes du canal 1 et du canal 2 sur l'oscilloscope et régler VR105 de telle sorte que la forme d'onde autour du point de déclenchement soit telle qu'il est montré sur l'illustration.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

E. Ajuste del desenfoque

(1) Conectar el canal 1 del osciloscopio al TJ301 (Punto de prueba RF) y el canal 1 al terminal TJ101, (Punto de prueba de desenfoque) de la tablilla principal de circuítos impresos.

			TJ301(CANAL-1)	TJ102 (CANAL-2)
Fijación del osciloscopio	Voltaje	:	500mV	100mV
	Barrido	:	0.5msec.	
	Selector de potencia de entrada	:	CA	CD
	Modo	:	NORM (Disparo vía CANAL-1)	

(2) Encender el interruptor de fuente de energía del tocadiscos.
(3) Poner el disco de pureba (SZZP1057C...el disco de la banda negra) en el soporte del disco con el botón de abrir/cerrar.
(4) El tocadiscos en el modo de audición.
(5) Tocar TR9 del disco de prueba.
(6) Verificar las formas de onda del canal 1 y el canal 2 en el osciloscopio y ajustar VR105 de manera que la forma de onda alrededor del punto de disparo tiene gue estar como muestra la figura.
(7) Apagar el interruptor de la fuente de energía del tocadiscos.



Main PCB

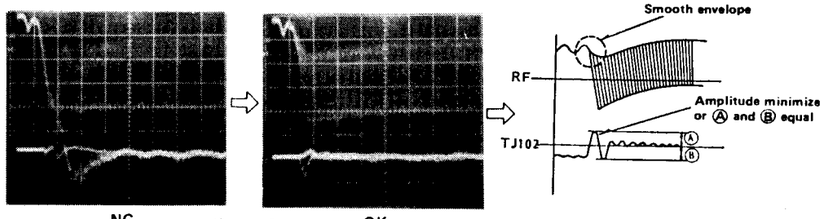


Fig. 14
Tracking offset

F. Tracking Offset Adjustment

(1) Connect CH-1 of the oscilloscope to the **TJ301 (RF test point)** and CH-2 to terminal **TJ101.** (Tracking offset test point)on the main PCB. Connect GND of the oscilloscope to the RF test point (TJ302) on the main PCB as shown in the illustration.

			TJ301 (CH-1)	TJ101(CH-2)
Oscilloscope setting	Volt	:	500mV	100mV
	Sweep	:	0.5msec	
	Input Selector	:	AC	DC
	Mode	:	NORM(Triggering Via CH-1).	

(2) Turn on the power supply switch of the player.
(3) Place the test disc **(SZZP1057C . . . Black band disc)** into the disc holder.
(4) The player to the play mode.
(5) Play **TR9** of the test disc.
(6) Check CH-1 and CH-2 waveforms displayed on the oscilloscope and adjust **VR103** so that the waveforms shall be as shown in the illustration.
(7) Turn off the power supply switch of the player.

F. Einstellung des Spurausgleichs

(1) CH-1 des Oszilloskops an TJ301 (RF-Meßpunkt) und CH-2 an die Klemme TJ101 (Meßpunkt fur Spurführungs-Abstand) auf der Haupt-Schaltplatte anschließen. GND (Erdung) des Oszilloskops an den RF-Meßpunkt auf der Haupt-Schaltplatte (TJ302) wie in der Abbildung anschließen.

			TJ301(CH-1)	
Einstellung des Oszilloskops	Spannung	:	500 mV	100mV
	Ablenkung	:	0,5 msec.	
	Eingangsumschalter	:	Wechselstrom	Gleichstrom
	Betriebsart	:	NORM (Auslösung über CH-1)	

(2) Stromversorgung des Geräts einschalten.
(3) Testdisk (SZZP1057C...Schwarzes Band) durch Betätigung der Auf/Zu-Taste in das Gerät einlegen.
(4) Das Gerät auf Wiedergabe stellen.
(5) TR (Spur) 9 auf dem Testdisk abspielen.
(6) Signalformen von CH-1 und CH-2 auf dem Oszilloskop überprüfen und VR103 so einstellen, daß die Signalformen wie auf der Abbildung aussehen.
(7) Stromzufuhr zum Gerät abschalten.

F. Réglage du décentrement d'alignement

(1) Raccorder le canal 1 de l'oscilloscope à TJ301 (point de mesure à haute fréquence) et le canal 2 à la borne TJ101 (point de mesure du décentrement d'alignement) sur la plaquette à circuits imprimés principale.
Raccorder la mise à la terre de l'oscilloscope au point de mesure à haute fréquence (TJ302) sur la plaquette à circuits imprimés principale, comme il est montré sur l'illustration.

			TJ301 (Canal 1)	TJ101 (Canal 2)
Réglages de l'oscilloscope	Tension	:	500 mV	100 mV
	Balayage	:	0,5 msec.	
	Sélecteur d'entrée	:	C.A.	C.C.
	Mode	:	NORM (Déclenchement via la canal 1)	

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Installer le disque d'essai (SZZP1057C...Disque à plage noire) dans le dispositif de support pour disque.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer la piste 9 du disque d'essai.
(6) Vérifier les formes d'ondes du canal 1 et du canal 2 affichées sur l'oscilloscope et régler VR103 de telle sorte que les formes d'ondes soient telles qu'il est montré sur l'illustration.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

F. Ajuste del desvío de trayectoria

(1) Conectar el canal 1 del osciloscopio a TJ301 (Punto de prueba RF) y el canal 2 al terminal TJ101. (Punto de prueba de descentramiento de pista) en la tablilla de circuítos integrados.

			TJ301 (CANAL-1)	TJ101 (CANAL-2)
Fijación del osciloscopio	Voltaje	:	400mV	100mV
	Barrido	:	0,5mseg.	
	Selector de potencia de entrada	:	CA	CD
	Modo	:	NORMA (Disparo vía CANAL-1)	

(2) Encender el interruptor de fuente de energía del tocadiscos.
(3) Poner el disco de prueba (SZZP1057C...disco de la banda negra) en su soporte.
(4) El tocadiscos en el modo de audición.
(5) Tocar TR9 en el disco de prueba.
(6) Verificar las formas de onda de los canales 1 y 2 que se muestran en el oscilador y ajustar VR103 de manera que las formas de onda sean como muestra la figura.
(7) Apagar el interruptor de fuente de energía del tocadiscos.

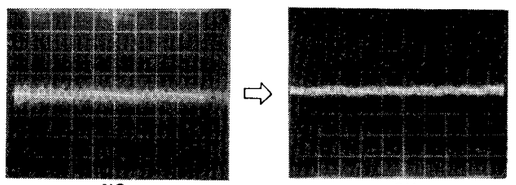


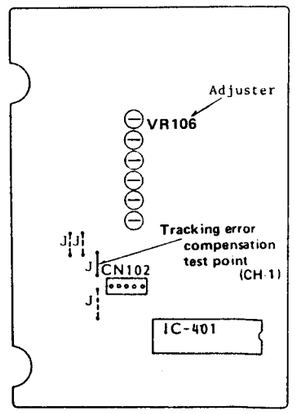
Fig. 15

G. Tracking error Compensation Adjustment

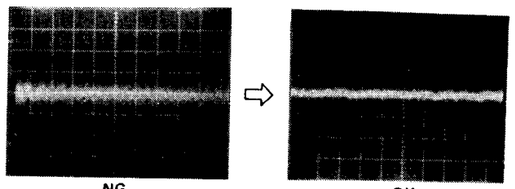
(1) Connect CH-1 of the oscilloscope to the **tracking error compensation test point** (Jumper) and GND to chassis as shown in the illustration.

Oscilloscope setting	Volt	: 50mv
	Sweep	: 1ms
	Input selector	: DC

(2) Turn on the power supply switch of the player.
(3) Place the test disc **(SZZP1014F** or **SZZP1054C)** into the disc holder by open/close button.
(4) The player to the play mode.
(5) Play **TR1** of the test disc
(6) Check the waveform on the oscilloscope and adjust **VR106,** so that the waveform at DC level less than **0±5mV** as shown in the illustration.
(7) Turn off the power supply switch of the player.

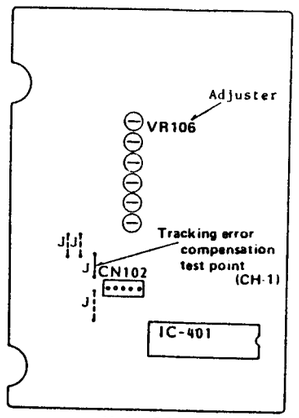


Main PCB



NG OK

Fig. 15



Main PCB

G. Einstellung des Spurfehlerausgleichs

(1) CH-1 des Oszilloskops an den Meßpunkt für Spurfehlerausgleich (Brücke) und GND (Erdung) an das Gehäuse anschließen (s.Abb.).

Einstellung des Oszilloskops---
- Spannung : 50 mV
- Ablenkung : 1ms
- Eingangsumschalter : Gleichstrom

(2) Stromzufuhr zum Gerät einschalten.
(3) Testdisk SZZP1014F oder SZZP1054C durch Betätigung der Auf/Zu-Taste einlegen.
(4) Das Gerät auf Wiedergabe schalten.
(5) TR (Spur) 1 auf dem Testdisk abspielen.
(6) Signalform auf dem Oszilloskop überprüfen und VR 106 so einstellen, daß das Signal des Gleichstroms wie in der Abbildung weniger als 0±5mV beträgt.
(7) Stromzufuhr zum Gerät abschalten.

G. Réglage de la compensation d'erreur d'alignement

(1) Raccorder le canal 1 de l'oscilloscope au point de mesure (jarretière) de compensation d'erreur d'alignement et la mise à la terre au châssis, comme il est montré sur l'illustration.

Réglages de l'oscilloscope ---
- Tension : 50 mV
- Balayage : 1 msec.
- Sélecteur d'entrée : C.C.

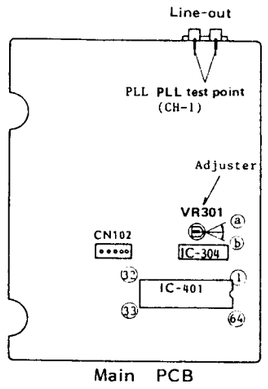
(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Installer le disque d'essai (SZZP1014F ou SZZP1054C) dans le dispositif du support pour disque en utilisant la touche d'ouverture/fermeture.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer la piste 1 du disque d'essai.
(6) Vérifier la forme d'onde sur l'oscilloscope et régler VR106 de telle sorte que la forme d'onde au niveau C.C. soit inférieure à 0±5mV, comme il est montré sur l'illustration.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

G. Ajuste de compensación de error de pista

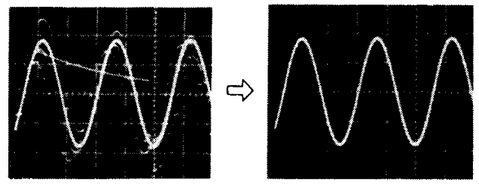
(1) Conectar el canal 1 del oscilador al punto de prueba de compensación de error de pista (puente) y TIERRA a la masa como muestra la figura.

Fijación del osciloscopio --
- Voltaje : 50 mV
- Barrido : 1mseg.
- Selector de potencia de entrada : CD

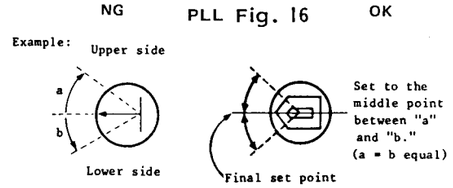
(2) Conectar el interruptor de fuente de energia del tocadiscos.
(3) Poner el disco de prueba (SZZP1014F o SZZP1054C) en el soporte del disco con el botón de cerrar/abrir.
(4) Poner el tocadiscos en el modo de audioreproducción.
(5) Tocar TR1 en el tocadiscos.
(6) Verificar la forma de onda en el osciloscopio, ajustando VR106 de manera que la forma de onda del nivel CD sea menor de 0+5mV como se ve en la figura.
(7) Desconectar el interruptor de fuente de energía del tocadiscos.



Main PCB



NG PLL Fig. 16 OK



H. PLL Adjustment

(1) Connect CH-1 of the oscilloscope to the **line out terminal** (either of L-CH or R-CH) of the main PCB and the terminal GND of the chassis.

Oscilloscope setting ---
- Volt : 1.0V
- Sweep : 1msec.
- Input selector : DC

(2) Turn on the power supply switch of the player.
(3) Place the test disc **(SZZP1054C)** in to the disc holder by open/close key.
(4) The player to the play mode.
(5) Play **Track 7 (WG 0.8mm)** of the test disc.
(6) Check the waveform displayed on the oscilloscope and adjust **VR301** in the following steps.
ⓐ Turn VR301 upwards slowly and learn the point at which the waveform on the oscilloscope begins to be **disturbed** as shown in waveform NG .
ⓑ Turn VR301 downward slowly (opposite direction) and observe the point at which the waveform on the oscilloscope begins to be **disturbed.**
ⓒ **Set VR301 in the middle between the points observed in the above steps "a" and "b".**
(7) Die Stromzufuhr zum Gerät abschalten.

H. PLL-Einstellung

(1) CH-1 des Oszilloskops an die Line out-Klemme (von L-CH oder R-CH) auf der Haupt-Schaltplatte und die GND-Klemme des Gehäuses anschließen.

Einstellung des Oszilloskops---
- Spannung : 1,0V
- Ablenkung : 1ms
- Eingangsumschalter : Gleichstrom

(2) Die Stromversorgung des Geräts einschalten.
(3) Mit dem open/close-Schalter den Testdisk (SZZP1054C) in das Gerät einlegen.
(4) Das Gerät auf Wiedergabe stellen.
(5) TR (Spur) 7 auf dem Testdisk (WG 0,8mm) abspielen.
(6) Die Signalform auf dem Oszilloskop beobachten und VR 301 folgendermaßen einstellen.
ⓐ VR 301 langsam nach oben drehen und dabei auf den Punkt achten, an dem die Signalform wie in der Abbildung NG (falsch) gestört wird.
ⓑ VR 301 langsam nach unten drehen (entgegengesetzt zu a) (oben) und herausfinden, an welchem Punkt die Signalform auf dem Oszilloskop beginnt, gestört zu werden.
ⓒ VR 301 in eine Mittelposition zwischen den Punkten aus den Schritten a) und b) einstellen.

H. Réglage du circuit d'asservissement de phase

(1) Raccorder le canal 1 de l'oscilloscope à la borne de sortie de ligne (soit au canal de gauche soit au canal de droite) de la plaquette à circuits imprimés principale et à la borne de mise à la terre du châssis.

Réglages de l'oscilloscope ---
- Tension : 1,0 V
- Balayage : 1 msec.
- Sélecteur d'entrée : C.C.

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Placer le disque d'essai (SZZP1054C) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer la piste 7 du disque d'essai (coin de 0,8 mm).
(6) Vérifier la forme d'onde affichée sur l'oscilloscope et régler VR301 selon les étapes suivantes.
ⓐ Tourner lentement VR301 vers le haut et observer le point où la forme d'onde sur l'oscilloscope commence à être perturbée, comme il est montré sur la forme d'onde NG (incorrect).
ⓑ Tourner lentement vers le bas VR301 (dans la direction opposée) et observer le point où la forme s'onde sur l'oscilloscope commence à être perturbée.
ⓒ Régler VR301 au milieu, entre les points observés aux étapes "a" et "b" ci-dessus.

H. Ajuste PLL

(1) Conectar el canal 1 del osciloscopio al terminal de la línea de salida (canal de la izquierda o de la derecha) de la tablilla principal de circuítos impresos y el terminal de TIERRA a masa.

Fijación del osciloscopio --
- Voltaje : 1,0 V
- Barrido : 1mseg.
- Selector de potencia de entrada: CD

(2) Encender el interruptor de fuente de energia del tocadiscos.
(3) Poner el disco de prueba (SZZP1054C) en su soporte con la llave de abierto/cerrado.
(4) El todaciscos en el modo de audición.
(5) Tocal la pista 7 (WG 0,8mm) del disco de prueba.
(6) Verificar la forma de onda que se muestra en el osciloscopio y ajustar VR 301 (resistencia variable) en los siguientes pasos.
ⓐ Girar poco a poco hacia arriba VR301 y observar el punto en que la forma de onda del osciloscopio comienza a disturbarse como muestra la forma de onda NG ,
ⓑ Hacer girar VR301 hacia abajo poco a poco (en dirección contraria) y tomar nota del punto en que la forma de onda en el osciloscopio comienza a deformarse. opio comienza a defor-
ⓒ Fijar VR 301 en el punto medio entre los dos anotados en los pasos arriba mencionados "a" y "b".
(7) Apagar el interruptor de la fuente de energía del tocadiscos.

Technics Test Disc "SZZP1054C"	
Track number 12	0.6mm Wedge
Track number 13	0.7mm Wedge
Track number 5	0.6mm Black spot
Track number 6	0.7mm Black spot

I. Check of play operation after adjustment

(1) Check of skip search
1) Play an ordinary disc.
2) Press the skip button and check to see that the skip search functions (Forward and reverse)

(2) Check of manual search
1) Play an ordinary disc.
2) Press the manual search button and check to see that smooth manual search can be done at low and high speeds (Forward and reverse)

(3) Check to make sure the best adjusted condition for defects.
1) Play the Technics test disc "SZZP1054C".
2) Play the track 12 (Wedge 0.6 mm), track 13 (Wedge 0.7mm), and see that there is no sound skip or noise.
3) Play the tracks (Black spot 0.6mm), track 6 (Black spot 0.7mm) and see that there is no sound skip or noise.

I. Vérification du fonctionnement de l'audition après le réglagle

(1) Vérification de la recherche par sauts :
1. Faire jouer un disque normal.
2. Appuyer sur les touches de saut et vérifier si la recherche par sauts fonctionne (vers l'avant et vers l'arrière).

(2) Vérification de la recherche manuelle:
1. Faire jouer un disque normal.
2. Appuyer sur la touche de recherche manuelle et vérifier si une recherche manuelle (vers l'avant et vers l'arrière) aisée et sans à-coups peut être effectuée à des vitesses faibles et élevées.

(3) Vérifier pour s'assurer des conditions de réglage les meilleures pour localiser les défauts.
1) Faire jouer le disque d'essai Technics "SZZP1054C".
2) Faire jouer la piste 12 (coin de 0,6 mm) et la piste 13 (coin de 0,7 mm), et vérifier qu'il n'y ait pas de zones de silence ou de bruit.
3) Faire jouer la piste 5 (zone d'interférence de 0,6 mm) et la piste 6 (zone d'interférence de 0,7 mm) et vérifier qu'il n'y ait pas de zones de silence ou de bruit.

I. Überprüfung der Wiedergabe nach der Einstellung

(1) Überprüfung der autom. Liedanfang-Suche:
1. Einen normalen Disk abspielen.
2. Suchknopf drücken und vergewissern, daß die Suche durchgeführt wird. (Vorwärts und rückwärts).

(2) Überprüfung der manuellen Liedanfang-Suche:
1. Einen normalen Disk spielen.
2. Handsuchknopf drücken und vergewissern, daß die manuelle Suche bei hoher und normaler Geschwindigkeit reibungslos abläuft. (Vorwärts und rückwärts)

(3) Die optimale Einstellung im Falle von Störungen herausfinden.
1) Technics Testdisk "SZZP1054C" abspielen.
2) Spur 12 (Keil 0,6mm) und Spur 13 (Keil 0,7mm) abspielen und darauf achten, daß nichts übersprungen wird und daß kein Geräusch auftritt.
3) Spur 5 (schwarzer Fleck 0,6mm) und Spur 6 (schwarzer Fleck 0,7mm) abspielen und darauf achten, daß nichts übersprungen wird und daß kein Geräusch auftritt.

I. Verificación de la operación de audición después del ajuste

(1) Verificación del salto de rastreo:
1. Tocar una disqueta ordinaria.
2. Presionar el botón de salto (silencio) y verificar si ocurre el salto de rastreo. (De avance y retroceso).

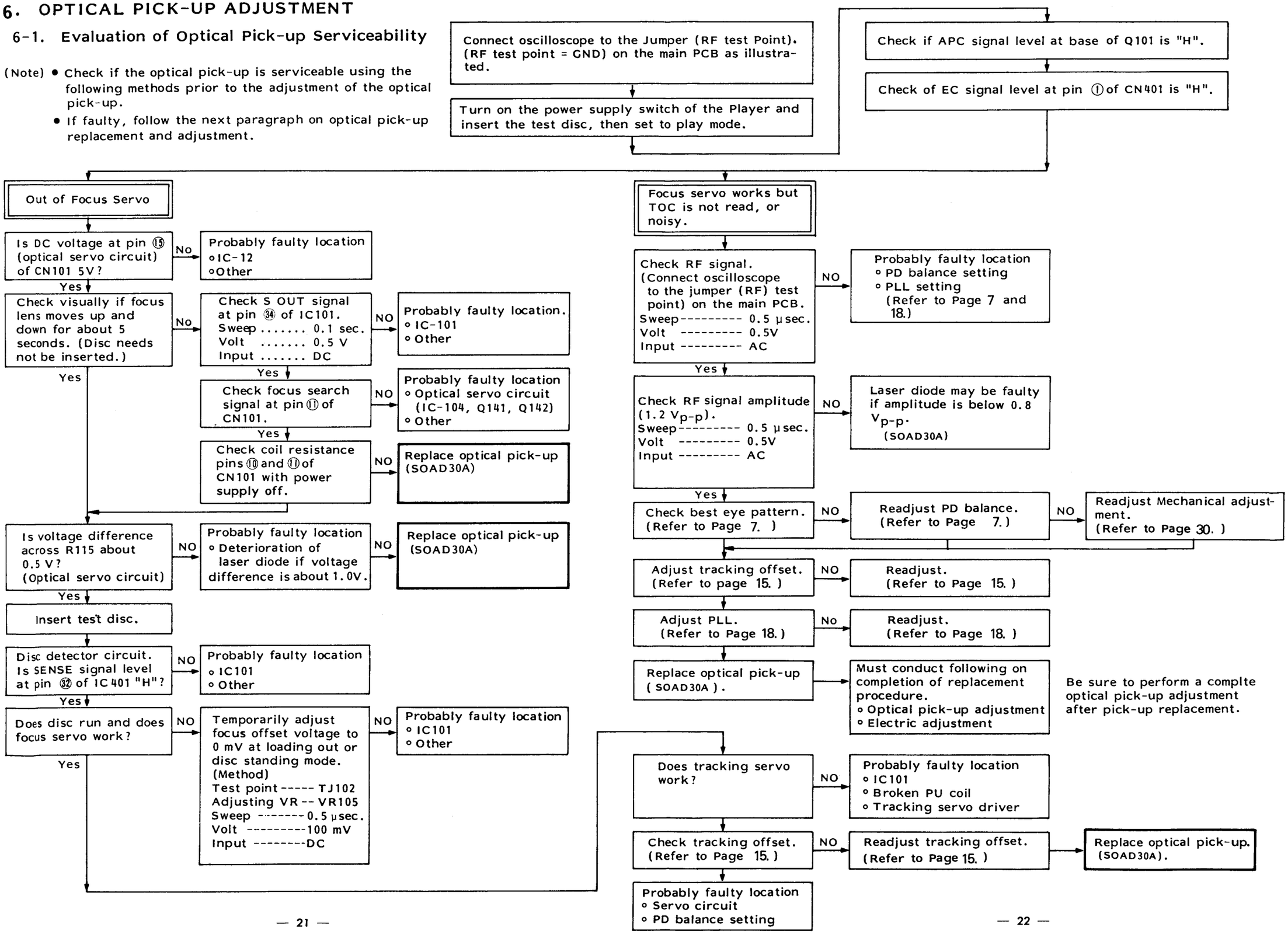
(2) Verificación del rastreo manual:
1. Tocar una disqueta ordinaria.
2. Presionar el botón de rastreo manual y comprobar si se realiza suavemente el rastreo manual a velocidades bajas y altas (De aavance y retroceso).

(3) Verificar y asegurarse que se ha ajustado sin ningún defecto.
1) Tocar el disco de prueba de Technics "SZZP1054C"
2) Tocar la pista 12 (Desplazamiento 0,6mm), la pista 12 (Desplazamiento 0,7mm), viendo si hay saltos de sonido o ruído.
3) Tocas las pistas (Punto negro 0,6mm), la pista 6 (punto negro 0,7mm) viendo si hay saltos de sonido o ruído.

6. OPTICAL PICK-UP ADJUSTMENT

6-1. Evaluation of Optical Pick-up Serviceability

(Note) • Check if the optical pick-up is serviceable using the following methods prior to the adjustment of the optical pick-up.
• If faulty, follow the next paragraph on optical pick-up replacement and adjustment.


Connect oscilloscope to the Jumper (RF test Point). (RF test point = GND) on the main PCB as illustrated.
Turn on the power supply switch of the Player and insert the test disc, then set to play mode.
Check if APC signal level at base of Q101 is "H".
Check of EC signal level at pin ⑪ of CN401 is "H".
Out of Focus Servo
Is DC voltage at pin ⑮ (optical servo circuit) of CN101 5V?
No
Probably faulty location
∘ IC-12
∘ Other
Yes
Check visually if focus lens moves up and down for about 5 seconds. (Disc needs not be inserted.)
No
Check S OUT signal at pin ㉞ of IC101.
Sweep ..... 0.1 sec.
Volt ..... 0.5 V
Input ..... DC
NO
Probably faulty location.
∘ IC-101
∘ Other
Yes
Check focus search signal at pin ⑪ of CN101.
NO
Probably faulty location
∘ Optical servo circuit (IC-104, Q141, Q142)
∘ Other
Yes
Check coil resistance pins ⑩ and ⑪ of CN101 with power supply off.
NO
Replace optical pick-up (SOAD30A)
Yes
Is voltage difference across R115 about 0.5 V? (Optical servo circuit)
NO
Probably faulty location
∘ Deterioration of laser diode if voltage difference is about 1.0V.
NO
Replace optical pick-up (SOAD30A)
Yes
Insert test disc.
Disc detector circuit. Is SENSE signal level at pin ㉜ of IC401 "H"?
NO
Probably faulty location
∘ IC101
∘ Other
Yes
Does disc run and does focus servo work?
NO
Temporarily adjust focus offset voltage to 0 mV at loading out or disc standing mode.
(Method)
Test point ----- TJ102
Adjusting VR -- VR105
Sweep ------- 0.5 µsec.
Volt --------- 100 mV
Input -------- DC
NO
Probably faulty location
∘ IC101
∘ Other
Yes
Focus servo works but TOC is not read, or noisy.
Check RF signal. (Connect oscilloscope to the jumper (RF) test point) on the main PCB.
Sweep--------- 0.5 µsec.
Volt --------- 0.5V
Input --------- AC
NO
Probably faulty location
∘ PD balance setting
∘ PLL setting
(Refer to Page 7 and 18.)
Yes
Check RF signal amplitude (1.2 Vp-p).
Sweep--------- 0.5 µsec.
Volt --------- 0.5V
Input --------- AC
NO
Laser diode may be faulty if amplitude is below 0.8 Vp-p.
(SOAD30A)
Yes
Check best eye pattern. (Refer to Page 7.)
NO
Readjust PD balance. (Refer to Page 7.)
NO
Readjust Mechanical adjustment. (Refer to Page 30.)
Adjust tracking offset. (Refer to page 15.)
NO
Readjust. (Refer to Page 15.)
Adjust PLL. (Refer to Page 18.)
No
Readjust. (Refer to Page 18.)
Replace optical pick-up (SOAD30A).
Must conduct following on completion of replacement procedure.
∘ Optical pick-up adjustment
∘ Electric adjustment
Be sure to perform a complte optical pick-up adjustment after pick-up replacement.
Does tracking servo work?
NO
Probably faulty location
∘ IC101
∘ Broken PU coil
∘ Tracking servo driver
Check tracking offset. (Refer to Page 15.)
NO
Readjust tracking offset. (Refer to Page 15.)
Replace optical pick-up. (SOAD30A).
Probably faulty location
∘ Servo circuit
∘ PD balance setting

6-2. How to Service Optical Pick-up
6-2. Wartung des Optischen Abnehmers
6-2. Comment reparer la tete de Lecture Optique
6-2. Como Funciona el Captador Optico

ENGLISH

The laser diode in the optical pick-up may be damaged by potential difference caused by static charge on clothing or body. Pay careful attention to damage by static charge when repaired.

FRANÇAIS

La diode laser installée dans la tête de lecture optique risque d'être endommagée par la différence de potentiel provoquée par la charge statique sur les vêtemenst ou le corps. Lorsqu'on répare, prendre garde à une éventuelle détérioration causée par la charge statique.

DEUTSCH

Die Laserdiode im optischen Abnehmer kann durch Spannungsunterschiede, die durch statische Aufladung der Kleidung oder des Körpers entstehen können, beschädigt werden. Bei Reparaturen ist es geraten, mögliche Schäden durch statische Aufladung zu verhindern.

ESPAÑOL

El diodo de láser en el captador óptico puede ser dañado por una diferencia de potencial causada por una carga estática o parásita de la ropa o el cuerpo. Tener mucho cuidado de no dañarlo con corriente parásita al repararlo.

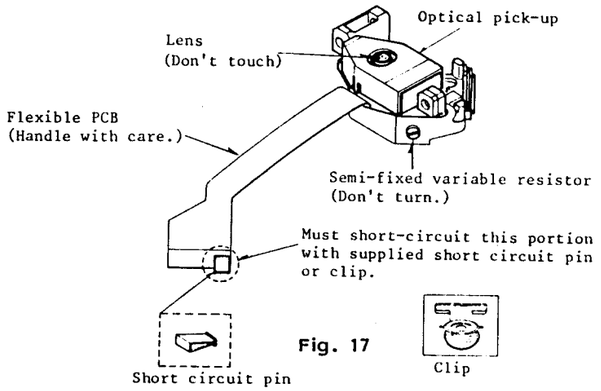


Fig. 17

ENGLISH

■ Handling of Optical Pick-up

1. Don't give a heavy shock to the optical pick-up which is very precisely constructed.
2. A charge prevention pin is inserted in the flexible PCB for preventing damage to the laser diode. **The shorting pin must not be removed for more than a few seconds at any time.**
3. Handle the flexible PCB with care because PCB may be cut if an excessive stress is applied. applied.
4. Do not turn the laser power adjustment variable resistor. It has already been adjusted at the factory.

DEUTSCH

■ Handhabung des optischen Abnehmers

1. Der optische Abnehmer ist ein Präzisionsinstrument, das keinen schweren Erschütterungen ausgesetzt werden sollte.
2. An der biegsamen Schaltplatte ist ein Kontakt angebracht, der die Laserdiode vor Beschädigung durch statische Aufladung schützt. Der Kurzschlußkontakt muß so schnell wie möglich aus-und eingebaut werden.
3. Die biegsame Schaltplatte sollte behutsam behandelt werden, da sie keine größeren Belastungen verträgt.
4. Der Regelwiderstand für die Leistung des Lasers ist vor dem Versand eingestellt worden und sollte belassen werden, wie er ist.

FRANÇAIS

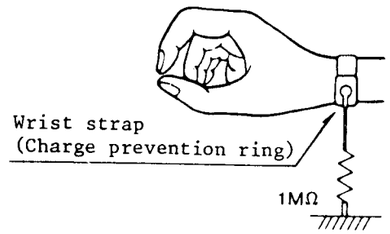
■ Manipulation de la tête de lecture optique

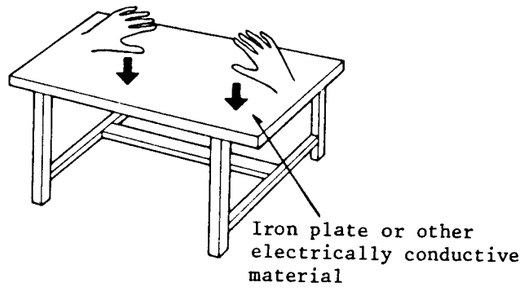
1. Ne pas donner de fortes secousses à la tête de lecture optique dont le montage est d'une grande précision.
2. **Une broche neutralisatrice de charge est insérée dans la plaquette à circuits imprimés flexible pour éviter l'endommagement de la diode laser. La broche de court-circuitage ne devar pas être retirée pendant plus de quelques secondes à n'importe quel moment.**
3. Manipuler la plaquette à circuits imprimés flexible avec précaution car elle risque d'être sectionnée si une tension excessive y est appliquée.
4. **Ne pas tourner la résistance variable du réglage d'énergie du laser. Elle a déjà été réglée à l'usine.**

ESPAÑOL

■ Manejo del captador óptico

1. Evitar los golpes en el captador óptico, que es un instrumento de gran precisión.
2. Para evitar daños en el diodo de láser, hay una grapa protectora en la TCI flexible. La grapa se debe poner o quitar en el tiempo más corto posible.
3. Manejar con cuidado la TCI flexible, porque podría cortarse al aplicarle tensión excesiva.
4. No tocar la RV de ajuste de láser, que ya está ajustado antes del envío.





ENGLISH

■ **Grounding to Prevent Static Charge Damage**

1. Body Grounding: Put on the charge preventing wrist strap for discharging electricity from the body.
2. Working Table Grounding: Lay electrically conductive material (conductive sheet) or an iron plate on the table where the optical pick-up is placed, and ground the material or sheet to the floor.

Note: Static charge of clothing is not discharged from the wrist strap. Exercise care so that clothing does not touch the wrist strap.

FRANÇAIS

■ **Mise à la terre pour éviter une détérioration de la charge statique.**

1. Mise à la terre du corps:
   Installer une attache neutralisatrice de charge au poignet pour le déchargement de l'électricité provenant du corps.
2. Mise à la terre de la table de travail:
   Installer un matériau électriquement conductif (plaque conductible) ou une plaque de fer sur la table où la tête de lecture optique est placée et relier à la terre le matériau ou la plaque.

Nota: La charge statique des vêtements n'est pas déchargée de l'attache du poignet. On devra donc prendre garde à ce que les vêtements ne touchent pas l'attache du poignet.

DEUTSCH

■ Erdung zur Verhütung von Schäden durch statische Aufladung

1. Körpererdung:
   Legen Sie das Armband um, das Elektrizität aus dem Korper entlädt.
2. Arbeitstischerdung:
   Legen Sie elektrisch leitfähiges Material (Folie) oder eine Metallplatte auf dem Tisch aus, auf den der optische Abnehmer gelegt wird, und erden Sie das Material oder die Folie.

Hinweis: Ladungselektrizität der Kleidung wird vom Armband nicht entladen. Seien Sie vorsichtig, daß Ihre Kleidung das Arband nicht berührt.

ESPAÑOL

■ **Torque con la tierra para impedir carga estática.**

1. Contacto del cuerpo con tierra:
   Para la descarga de la electricidad estática del cuerpo, ponerse la banda pulsera.
2. Contacto del banco de trabajo con tierra:
   Poner sobre el banco de trabajo un material conductor (tapete conductor) o una placa metálica donde se ha de colocar el captador óptico, conectando con tierra el material conductor.

Nota: Carga estatica de vestidos no se descarga de la faja de pulsera. Tener cuidado para que la faja de pulsera no se torque con vestidos.

7. OPTICAL PICK-UP REPLACEMENT PROCEDURE

Note: Exercise care so that disassembled parts are not lost.
Prepare the player for service under power as shown in the illustration follow the disassembly procedure outlined in the service manual.

(1) Remove the front panel.
(2) Pushing the two stopper pawls of the disc holder inward simultaneously, pull the holder to remove it.
(3) Remove the resisting plate for the position detector.

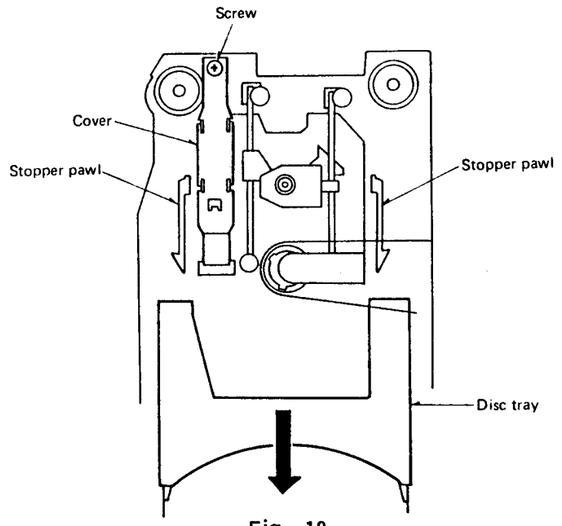
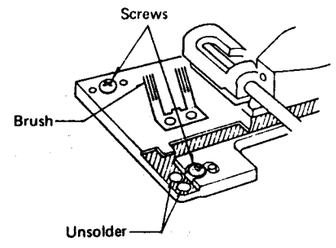


Fig. 19

(4) Unsolder the linear motor drive coil and optical pick-up to separate them.
(5) Remove the two linear motor drive coil fastening screws.
Note: Handle the contact brush carefully.



(6) Disconnect the optical pick-up 17-pin flexible cord from connector CN101 on the main PCB.
Note: 1. Pull out the connector at the point indicated by the arrow.
2. Pull out the flexible cord.

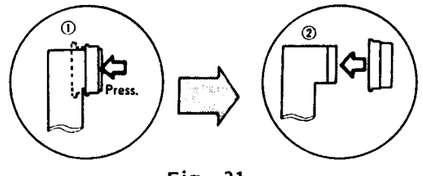


Fig. 21

(7) Remove the three optical pick-up fastening screws.
(8) Remove the optical pick-up fastening shaft.
Note: Be careful not to lose or misplace the cushion rubber.
(9) The optical pick-up has now been completely separated.
It is not necessary to remove the traverse unit as before. If the unit needs to be removed, pay attention to the four springs. (See page 20 Fig. 24)

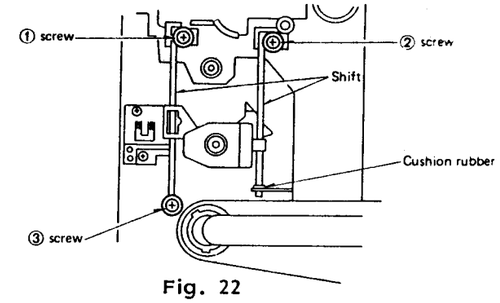


Fig. 22

(10) Remove the linear motor coil fastening bracket.

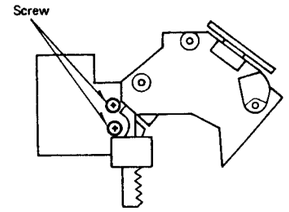


Fig. 23

(11) Install the optical pick-up in the reverse order of disassembly so that Power On Check can be conducted. Refer to the illustrations.

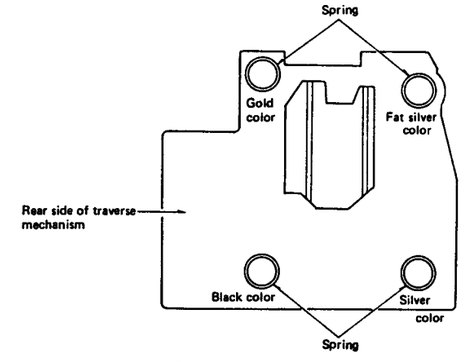


Fig. 24 Front side

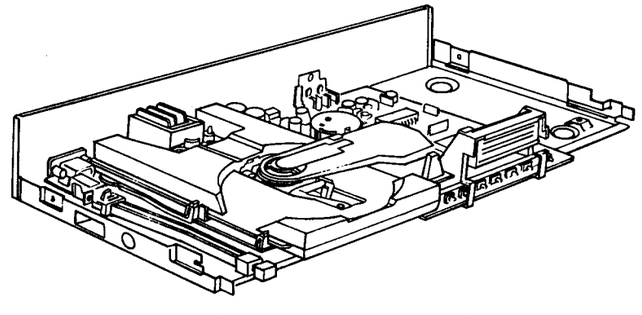


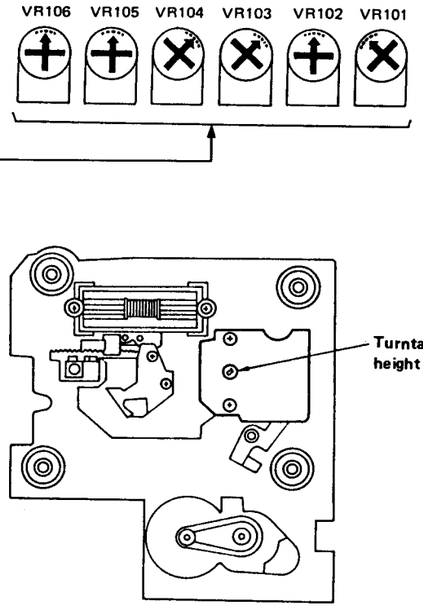
Fig. 25 Power ON check status

8. ADJUSTING PROCEDURE OF OPTICAL PICK-UP
8. EINSTELLUNG DES OPTISCHEN ABNEHMERS
8. PROCEDURE DE RÉGLAGE DE LA TÊTE DE LECTURE OPTIQUE
8. PROCEDIMIENTO DE AJUSTE DEL CAPTADOR OPTICO

8-1. Adjusting steps and Points of optical pick-up
8-1. Schritte und Vorgänge bei der Einstellung des optischen Abnehmers
8-1. Points et étapes du réglage de la tête de lecture optique
8-1. Pasos del ajuste y puntos del captador óptico

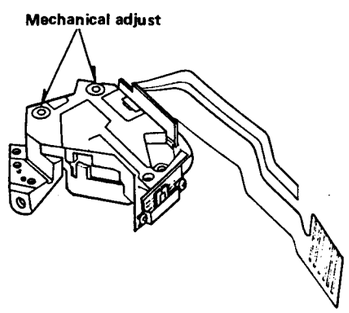
- Set up player according to disassembly procedure so that power-on check can be conducted.
- Regelwiderstände auf der Haupt-Schaltplatte wie in der Abbildung gezeigt provisorisch einstellen.
- Monter l'appareil selon la procédure inverse du démontage de telle sorte qu'une vérifiaction de mise sous tension puisse être effectuée.
- Fijar el tocadiscos para el proceso de desarmado de forma que se pueda hacer la verificación del contacto con la fuente de energía

- Temporarily set variable resistors on main PCB as shown.
- Regelwiderstände provisorisch an die Servo-Schaltplatte legen.
- Régler temporairement les résistances variables sur la plaquette à circuits imprimés principale comme il est illustré.
- Ajustar temporalmente las resistencias variables de la TCI de servo.



- Adjust turntable height.
- Drehtellerhöhe einstellen.
- Hauteur de réglage de la platine
- Ajustar la altura del plato giratorio.

- Mechanical adjustment
- Mechanische Einstellung
- Réglage mécanique
- Ajuste mecánico.



- Electric adjustment
- Elektrische Einstellung
- Réglage électrique
- Ajuste eléctrico.

Fig. 26

8-2. Required Measuring Instruments and Tools

1. Two-channel oscilloscope (with external trigger), over 30 MHz.
2. Test disc (SZZP1014F) or (SZZP1054C)
3. Hexagonal wrench--------1.5 mm (SZZP1044C)
4. General tools

8-2. Erforderliche Instrumente und Werkzeuge

1. 2-Kanal Oszilloskop (mit externem Auslöser) über 30 MHz.
2. Testdisk SZZP1014F oder SZZP1054C
3. Inbus-Schlüssel ---------1,5mm (SZZP1044C)
4. Allgemein übliche Werkzeuge

8-2. Appareils et outils de mesurage requis

1. Oscilloscope à double canal (avec déclenchement extérieur); plus de 30 MHz.
2. Disque d'essai (SZZP1014F) ou (SZZP1054C).
3. Clé hexagonale ---------- 1,5mm (SZZP1044C)
4. Outils généraux

8-2. Pasos y puntos de ajuste del captador óptico

1. Osciloscopio de dos canales (con disparo exterior), de más de 30 MHz.
2. Disco de prueba (SZZP1014F) o (SZZP1054C).
3. Llave allen ----------1,5mm (SZZP1044C)
4. Herramientas generales

9. MECHANICAL ADJUSTMENT PROCEDURE
9. MECHANISCHER EINSTELLVORGANG
9. PROCÉDURE POUR LA MISE AU POINT MÉCANIQUE
9. PROCEDIMIENTO DEL AJUSTE MECANICO

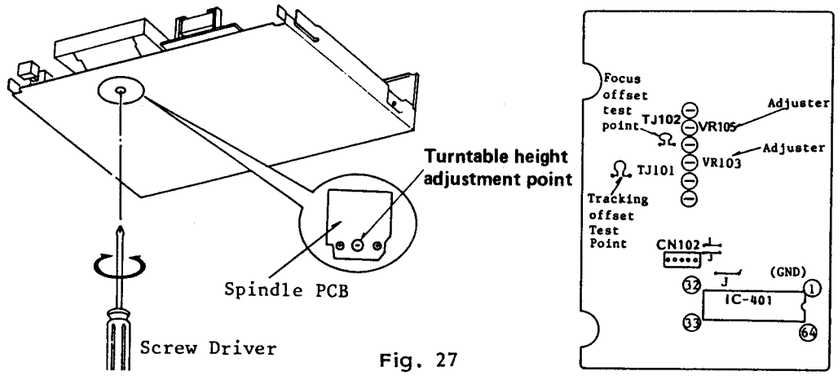
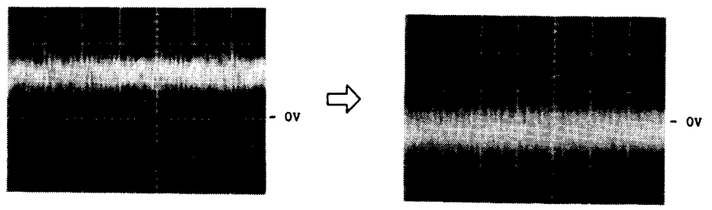


Fig. 27



NG Fig. 28 OK

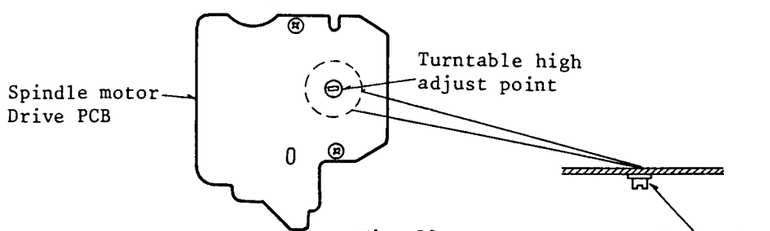


Fig. 29

A. Turn Table Height Adjustment

(1) Turn on the power supply switch of the player.
(2) Place the test disc (SZZP1014F) or (SZZP1054C) into the disc holder.
(3) Turn off the power supply switch of the player.
(4) Set the oscilloscope to DC zero balance.
(5) Connect the CH-1 of the oscilloscope to TJ102 of the servo circuit and GND to the chassis.

Oscilloscope settings --
- Sweep : 5m sec.
- Volt : 100mV
- Input selector : DC

(6) Turn on the power supply switch of the player.
(7) Play back a desired track.
(8) Place the unit in the corner of the workbench -- in the place that allows the adjustment -- and prepare as illustrated.
Do not jar or jolt the unit.
(9) Turn the adjusting screw on the underside of the spindle motor PCB with a flat screwdriver so that the waveform at TJ102 is 0 ± 50mV, as shown in the illustration.
(10) Turn off the power supply switch of the player.
(11) Lock the adjusting screw with "Screw lock paint (RZZ0L01)" on completion of adjustment.

A. Réglage de la hauteur de la platine

(1) Mettre en marche l'interrupteur d'alimentation de l'appareil.
(2) Installer le disque d'essai (SZZP1014F) ou (SZZP1054C) dans le dispositif de support pour disque.
(3) Mettre hors tension l'interrupteur d'alimentation de l'appareil.
(4) Régler l'oscilloscope avec un équilibrage sur zéro C.C.
(5) Raccorder le canal 1 de l'oscilloscope à TJ102 du circuit d'asservissement et GND (mise à la terre) au châssis.

Réglages de l'oscilloscope
- Balayage : 5 msec.
- Tension : 100 mV
- Sélecteur d'entrée : C.C.

(6) Mettre en marche l'interrupteur d'alimentation de l'appareil.
(7) Faire jouer la piste désirée.
(8) Placer l'appareil au coin d'un établi -- à l'endroit qui vous permettra d'effectuer la mise au point -- et préparer comme il est illustré. Ne pas heurter ou donner de secousses à l'appareil.
(9) Tourner la vis de réglage située sur la face inférieure de la plaquette à circuits imprimés du moteur à pivot avec un tournevis à lame plate de telle sorte que la forme d'onde à TJ102 soit de 0 ± 50 mV, comme il est montré sur l'illustration.
(10) Mettre hors tension l'interrupteur d'alimentation de l'appareil.
(11) Bloquer la vis de réglage avec une peinture pour blocage de vis (RZZ0L01)" une fois achevée la mise au point.

A. Einstellung der Drehtellerhöhe

(1) Stromversorgung des Geräts einschalten.
(2) Testdisk SZZP1014F oder SZZP1054C einlegen.
(3) Stromversorgung des Geräts abschalten.
(4) Das Oszilloskop wie unten beschrieben einstellen.
(5) CH-1 des Oszilloskops an TJ 102 des Servo-Schaltkreises und GND (Erdung) des Gehäuses anschließen.

Einstellung des Oszilloskops
- Ablenkung : 5ms
- Spannung : 100mV
- Eingangsumschalter : Gleichstrom

(6) Stromzufuhr zum Gerät einschalten.
(7) Gewünschte Spur abspielen.
(8) Das Gerät auf der Stelle der Werkbank, die für die Einstellung geeignet ist, anbringen und vorsichtig damit umgehen, ohne es zu erschüttern.
(9) Die Einstellschraube an der Unterseite des Wellenmotor-Kontakts mit einem flachen Schraubenzieher so drehen, daß die Signalform wie in Abb. 5-3 bei TJ 102 0 ± 50mV beträgt.
(10) Die Stromzufuhr zum Gerät abschalten.
(11) Die Enstellschraube nach erfolgter Einstellung mit "Arretierlack (RZZ0L01)" fixieren.

A. Ajuste de la altura del plato giratorio

(1) Encender el interruptor de fuente de energía del tocadiscos.
(2) Poner el disco de prueba (SZZP1014F) o (SZP1054C) en el soporte del disco.
(3) Encender el interruptor de fuente de energía del tocadiscos.
(4) Fijar el osciloscopio en el balance cero de CD.
(5) Conectar el CANAL-1 del osciloscopio a TJ102 del circuíto de servo y TIERRA al chassis.

Fijaciones del osciloscopio
- Barrido : 5m
- Voltaje : 100mV
- Selector de potencia de entrada : CD

(6) Encender el interruptor de la fuente de energía del tocadiscos.
(7) Tocar algo en la pista que se desee.
(8) Poner la unidad en la esquina del banco de trabajo --- en un lugar que se avenga al ajuste--preparándolo tal como muestra la figura con cuidado de no agitarlo o golpearlo.
(9) Hacer girar el tornillo de fijación en la parte baja de la TCI del motor de vástago con un destorniliador plano hasta que la forma de onda en TJ102 sea ± 50mV como se muestra en la Fig. 5-3.
(10) Encender el interruptor de la fuente de energía del tocadiscos.
(11) Asegurar el tornillo de ajuste con "pintura aseguradora (RZZ0L01)" al completar el ajuste.

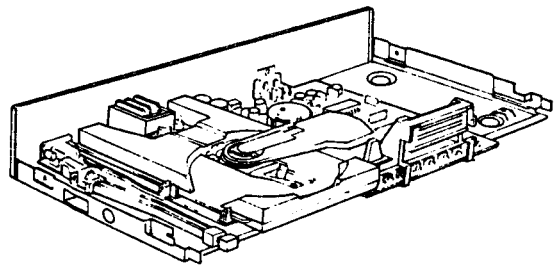


Fig. 30

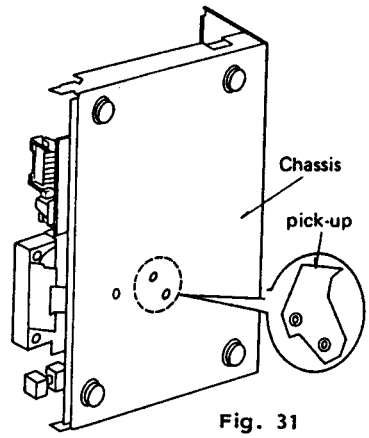
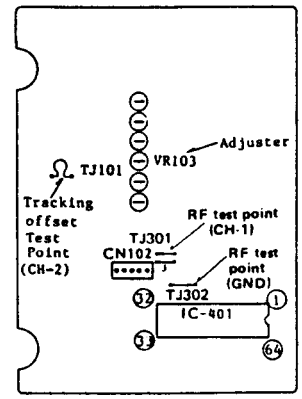
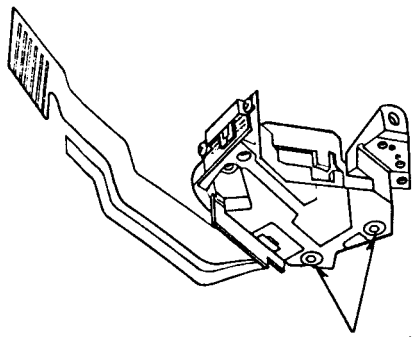


Fig. 31



Main PCB



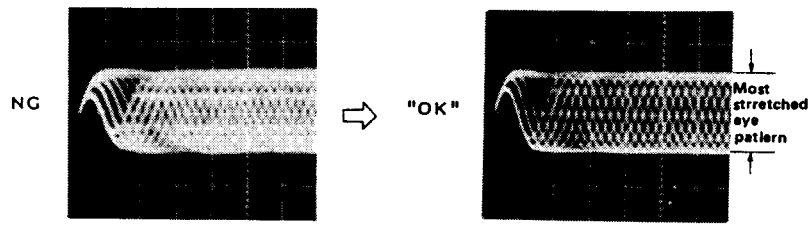


Fig. 32

B. Mechanical Adjustment

(1) Turn on the power supply switch of the player.

(2) Insert the test disc (SZZP1056C) in the disc holder.

(3) Turn off the power supply switch of the player.

(4) Set the oscilloscope as stated below.

Oscilloscope settings		
	Sweep	: 0.5 µsec.
	Volt	: 0.5V
	Input selector	: AC

(5) Connect CH-1 of the oscilloscope to TJ301 of RF test point and GPD to TJ302 of RF test point (GND).

(6) Turn on the power supply switch of the player.

(7) Play back TR9.

Note: If any track other than TR9 is played back, this adjustment cannot be achieved. If the temporary adjustment takes much time, it is advisable to set the player in the repeat mode.

(8) Set the player in the playback mode as shown in the illustration. Do not jar or jolt the unit.

(9) Keeping the player in the playback mode, place it as illustrated (stand it on its left side).
Note : If the player is stood on its right side, the adjustment cannot be made properly.

(10) Check if the RF signal waveform is as shown in the illustration (NG). If the waveform can not be checked or is unlike the given waveform, proceed to the following steps.

(11) Set the allen wrench (SZZP1044C. . .1.5mm) into the socket in the heads of the mechanical adjusting screws shown in the illustration and turn the both screws right or left to optimum positions.

(12) Turn off the power supply switch of the player.

(13) Lock both adjusting screw with screw lock paint (RZZ0L01) on completion of adjustment.

B. Mechanische Einstellung

(1) Stromversorgung des Geräts einschalten.
(2) Testdisk (SZZP1056C) in den Halter einlegen.
(3) Stromversorgung des Geräts abschalten.
(4) Das Oszilloskop wie unten beschrieben einstellen.

Einstellung des Oszilloskops		
	Ablenkung	: 0,5µs
	Spannung	: 0,5V
	Eingangsumschalter	: Wechselstrom

(5) CH-1 des Oszilloskops an TJ301 des RF-Meßpunkts und PGD an TJ301 des RF-Meßpunkts und GPD an TJ302 des RF-Meßpunkts (GND) anschließen.
(6) Stromversorgung des Geräts einschalten.
(7) TR6 abspielen.
(8) Das Gerät wie in der Abbildung auf Wiedergabe schalten und dabei aufpassen, daß es nicht erschüttert wird.

(9) Das auf Wiedergabe geschaltete Gerät wie in der Abbildung plazieren (auf seine linke Seite stellen).
Hinweis: Wenn das Gerät auf die rechte Seite gestellt wird, kann die Einstellung nicht optimal durchgeführt werden.
(10) Darauf achten, ob die RF-Signalform wie in der Abbildung (NG=falsch) aussieht. Falls sie nicht überprüft werden kann oder von der gegebenen Form abweicht, wie in den folgenden Schritten vorgehen.
(11) Sechskantschlüssel (SZZP1044C...1,5mm) wie in der Abbildung gezeigt in die Vertiefungen der Einstellschrauben einsetzen und beide Schrauben bis zur optimalen Einstellung nach rechts und links drehen.
(12) Stromzufuhr zum Gerät abschalten.
(13) Beide Schrauben nach erfolgter Einstellung mit Arretierlack (RZZ0L01) fixieren.

B. Réglage mécanique

(1) Mettre en marche l'interrupteur d'alimentation de l'appareil.
(2) Intaller le disque d'essai (SZZP1056C) dans le dispositif de support pour disque.
(3) Mettre hors tension l'interrupteur d'alimentation de l'appareil.
(4) Régler l'oscilloscope comme il est indiqué ci-dessous.

Réglages de l'oscilloscope	Balayage	:	0,5 µsec.
	Tension	:	0,5 V
	Sélecteur d'entrée	:	C.A.

(5) Raccorder le canal 1 de l'oscilloscope à TJ301 du point de mesure de haute fréquence et la mise à la terre à TJ302 du point de mesure de haute fréquence (masse).
(6) Mettre en marche l'interrupteur d'alimentation de l'appareil.
(7) Faire jouer la piste 6.
(8) Régler le lecteur sur le mode de lecture, comme il est montré sur l'illustration. Ne pas heurter ou donner de secousses à l'appareil.
(9) Tout en laissant le lecteur sur le mode de lecture, l'installer comme il est illustré (le déposer sur son côté gauche).
Nota: Si le lecteur est placé sur le côté droit, le réglage ne pourra être effectué correctement.
(10) Vérifier si la forme d'onde du signal de haute fréquence est telle qu'elle est montrée sur l'illustration (NG: incorrect). Si la forme d'onde ne peut être vérifiée ou si elle est différente de la forme d'onde donnée, procéder selon les étapes suivantes.
(11) Placer la clé hexagonale (SZZP1044C...1,5mm) dans l'alvéole des têtes des vis de réglage mécanique comme il est montré sur l'illustration et tourner les deux vis de droite et de gauche aux positions optimales.
(12) Mettre hors circuit l'interrupteur d'alimentation du lecteur.
(13) Bloquer les deux vis de réglage avec une peinture pour blocage de vis (RZZ0L01) une fois achevée la mise au point.

B. Ajuste mecánico

(1) Encender el interruptor de la fuente de energía del tocadiscos.
(2) Poner la disqueta de prueba (SZZP1056C) en su soporte.
(3) Apagar el interruptor de la fuente de energía del tocadiscos.
(4) Fijar el oscilozcopio de la manera que se indica a continuación.

Fijaciones del osciloscopio	Barrido	:	0,5 useg.
	Voltaje	:	0,5V
	Selector de potencia de entrada	:	CA

(5) Conectar el canal 1 del osciloscopio a TJ301 o al punto de prueba y TIERRA A TJ301 del punto de pureba RF (TIERRA).
(6) Encender el interruptor de la fuente de energía del tocadiscos.
(7) Escuchar la audición de la pista 6.
(8) Fijar el tocadiscos en el modo de audioreproducción como muestra la figura con cuidado de no agitarlo o golpearlo.
(9) Manteniendo el tocadiscos en el modo de audioreproducción, colocarlo según muestra la figura (Aguantándose sobre su lado izquierdo).
(Nota): Si se le hace aguantar sobre el lado derecho, el ajuste no se puede hacer debidamente.
(10) Verificar si la forma de onda de señal RF es como muestra la figura (NG). Si no se puede verificar la forma de onda o no se da con regularidad, tomar los siguientes pasos.
(11) Fijar la llave allen (SZZP104C)...1,5mm) en la cartela de las cabezas de los tornillos de ajuste mecánico como se muestra en la figura y hacer girar ambos tornillos a la derecha o a la izquieda hasta obtener la mejor posición.
(12) Desconectar el interruptor de fuente de anergía del tocadiscos.
(13) Asegurar los dos tornillos de ajuste con pintura aseguradora (RZZ0L01) al completar el ajuste.

10. CHECKING PROCEDURE FOR THE WHOLE ELECTRICAL CIRCUIT (IN TROUBLESHOOTING)
10. PRÜFVORGANG FÜR DIE ELEKTRISCHEN SCHALTKREISE (FEHLERSUCHE)
10. PROCÉDURE DE VÉRIFICATION POUR L'ENSEMBLE DU CIRCUIT ÉLECTRIQUE (LORS D'UN DÉPANNAGE)
10. PROCEDIMIENTO DE VERIFICACION PARA TODO EL CICUITO ELECTRICO (PARA SOLUCION DE DIFICULTADES)

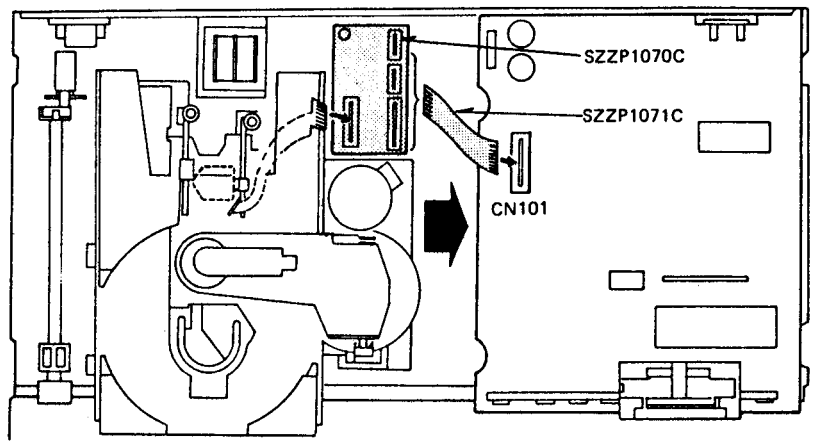


Fig.33

ENGLISH

The FPC cord from the optical pick-up is too short to check the back of the main PCB with case. Use the servicing fixture **(SZZP1070C) and (SZZP1071C)** and follow the procedure shown below. This fixture is not a must for performing electrical and mechanical adjustment.

(1) Disconnect the FPC cord from **CN101.**
(2) Attach a clip to the top end of the FPC cord. Do this within seconds after cord disconnect. (This is for protecting the optical pick-up against the breakdown due to static electricity.)
(3) Remove the four main PCB fastening screws.
(4) Shift the main PCB to the right side.
(5) Attach the servicing fixture **(SZZP1070C)** as illustrated.
(6) Connect the FPC cord from the optical pick-up to the connector to the fixture. (The other connectors are for the SL-P1200. Do not get them mixed up with the above connector.)
(7) Connect the junction FPC cord **(SZZP1071C)** to the output connector from the fixture, then connect the cord to CN101 on the main PCB. Each part on the back of the main PCB can easily be checked now.

DEUTSCH

Die Kürze des elastischen Steckkontaktkabels erlaubt keine Überprüfung der Rückseite der Haupt-Schaltplatte, ohne daß das Gehäuse abgenommen wird. Wartungsvorrichtungen SZZP1070C und SZZP1071C verwenden und wie unten gezeigt vorgehen. Die Wartungsvorrichtung ist bei elektrischen und mechanischen Einstellungen nicht unbedingt nötig.

(1) FPC-Kabel von CN101 abnehmen.
(2) Am Ende des FPC-Kabels unverzüglich nach dem Ausstecken eine Klammer anbringen. (Die Klammer schützt den optischen Abnehmer vor statischer Elektrizität. Sie ist aber nicht unbedingt nötig, wenn bei der Wartung eine Schutzmatte oder ähnliches verwendet wird.)
(3) Die vier Halteschrauben der Haupt-Schaltplatte abnehmen.
(4) Haupt-PCB nach rechts schieben.
(5) Die Wartungsvorrichtung (SZZP1070C) wie gezeigt anbringen.
(6) FPC-Kabel vom optischen Abnehmer am Stecker der Wartungsvorrichtung anbringen. (Die anderen Stecker sind für SL-P 1200. Bitte nicht verwechseln.)
(7) Außerdem das FPC-Verbindungskabel (SZZP1071C) am Ausgangsstecker der Vorrichtung anbringen und das Kabel mit CN101 auf der Haupt-Schaltplatte verbinden. Alle Teile auf der Rückseite der Haupt-Schaltplatte können nun leicht überprüft werden.

FRANÇAIS

Le câble à circuit imprimé flexible de la tête de lecture optique est trop court pour pouvoir vérifier le dos de la plaquette à circuits imprimés principale. Utiliser les dispositifs de dépannage (SZZP1070C) et (SZZP1071C), et suivre la procédure indiquée ci-dessous. Ces dispositifs ne sont pas nécessaires pour effectuer des réglages électrique et mécanique.

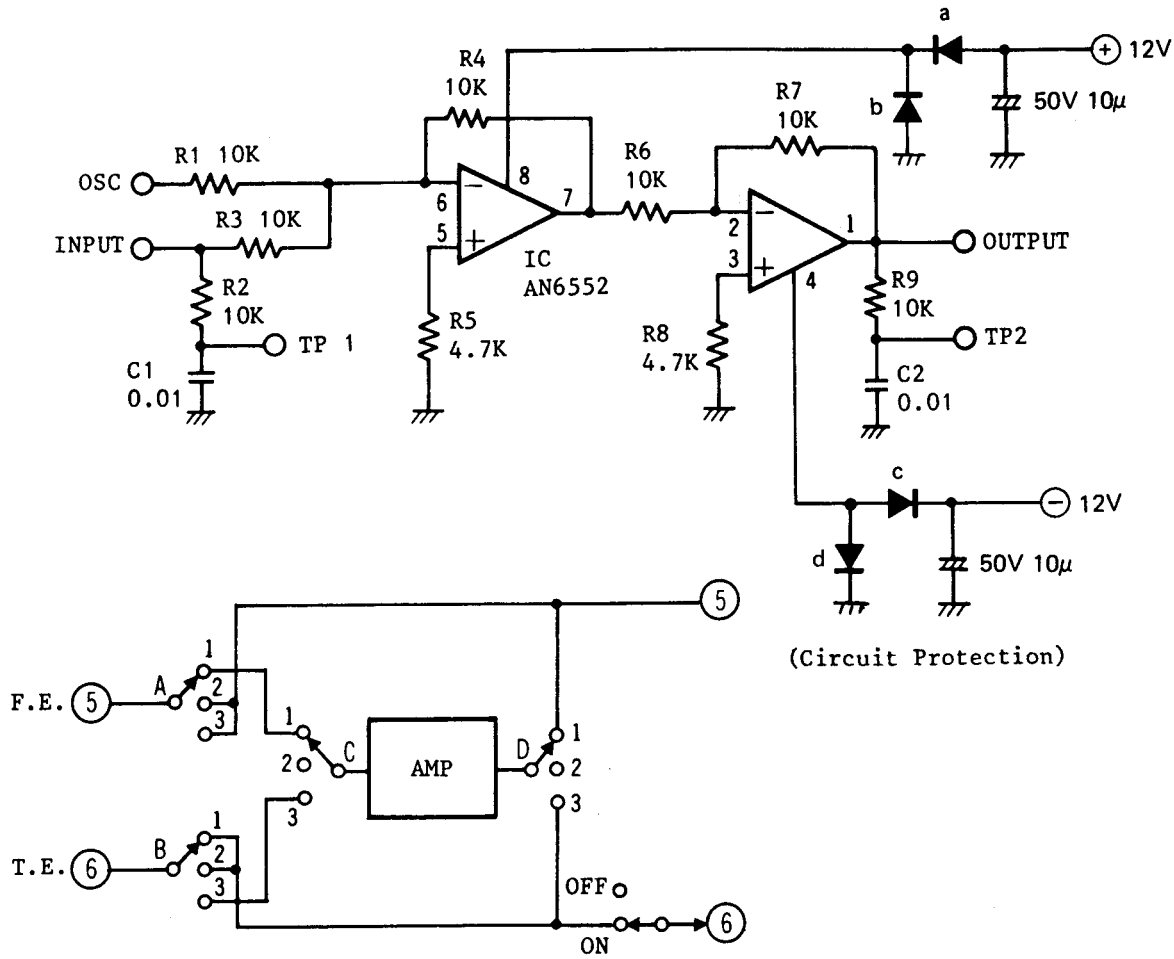
(1) Débrancher le câble à circuit imprimé flexible de CN101.
(2) Fixer une patte d'attache à l'extrémité supérieure du câble à circuit imprimé flexible. Effectuer cela en deçà de quelques secondes après avoir débranché la câble. (Ceci est pour protéger la tête de lecture optique d'une panne due à l'électricité statique.)
(3) Retirer les quatre vis de fixation de la plaquette à circuits imprimés principale.
(4) Déplacer la plaquette à circuits imprimés principale vers le côté droit.
(5) Placer le dispositif de dépannage (SZZP1070C) comme il est illustré.
(6) Raccorder le câble à circuits imprimés flexible de la tête de lecture optique au connecteur du dispositif de dépannage. (Les autres connecteurs sont pour le SL-1200. Ne les mélanger pas avec la connecteur ci-dessus.)
(7) Raccorder ultérieurement le câble à circuit imprimé flexible de jonction (SZZP1071C) au connecteur de sortie du dispositif de dépannage, puis raccorder le câble à CN101 sur la plaquette à circuits imprimés principale.
Chaque élément au dos de la plaquette à circuits imprimés principale peut maintenant être facilement vérifié.

ESPAÑOL

El cable FPC desde el colector óptico es demasiado corto para verificar la parte trasera de la tablilla de circuítos impresos principal en la caja. Usar la pieza de servicio (SZZP1071) y (SZZP1071C), siguiendo el procedimiento que se muestra abajo. Esta pieza de servicio no es relativamente de importancia para la realización de los ajustes mecánicos y eléctricos.

(1) Desconectar el cable FPC del CN101.
(2) Enganchar una presilla en el extremo superior del cable FPC. Hacerlo unos segundos después de desconectar el cable (Es para proteger el colector óptico de averiarse por causa de la electricidad estática.)
(3) Quitar los cuatro tornillos que aseguran la tablilla principal de circuítos impresos.
(4) Hacer deslizar a la derecha la tablilla principal de circuítos impresos.
(5) Poner la pieza de servicio (SZZP1070C) como muestra la figura.
(6) Conectar el cable FPC desde el captador óptico al conector de la pieza de servicio. (Los otros conectores son para el SL-P1200). No mezclarlos con dichos conectores).
(7) Conectar además el cable FPC de unión (SZZP1071C) al; conector de potencia de salida de la pieza de servicio, y luego a CN101 de la tablilla principal de circuítos impresos. Ahora se podrán verificar fácilmente los componentes de la tablilla principal de circuítos impresos.

11. SCHEMATIC DIAGRAMS OF SERVO GAIN ADJUSTER (SZZP1017F)



Ref. No.	Part No.	Q'ty
IC	AN6552	1
R 1,2,3,4,6,7,9	ERDS2TJ103	7
R 5,8	ERDS2TJ472	2
C 1,2	ECKD1H103ZF	2
C	ECEA1HU100	2
Connector	SSDJB13BXHA	1
Lead Wire	(180,600mm)	2
3 Wire with		1
a b c d (Diode)	MA162	4

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